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Volume 2

Analysis of Accident Sequences and Source Terms at Waste Treatment and Storage Facilities for Waste Generated by U.S. Department of Energy Waste Management Operations

Volume 2: Appendixes A and B

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**CHEMICAL SOURCE TERMS FOR LOW-LEVEL
MIXED WASTE ACCIDENTS**

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APPENDIX A:

CHEMICAL SOURCE TERMS FOR LOW-LEVEL MIXED WASTE ACCIDENTS

A.1 INTRODUCTION

The following tables provide the chemical source terms for low-level mixed waste accidents. The accident identifications used in the tables are as follows: IFF = incineration facility fire (in the feedstock staging area) and SHA = single drum handling accident.

TABLE A.1 Frequencies and Chemical Source Terms for WM-LLMW Drum Handling Accidents

WM PEIS Alternative	Site ^a	Initial Accident ^b	Accident Frequency (1/yr)	Release Amount (g)	Chemical ^c ID	Contaminant	Toxic Gas ^d	Release Time (min)
All	Bettis	SHA	2.4E-04	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	Bettis	SHA	2.4E-04	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	Bettis	SHA	8.5E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	Bettis	SHA	8.5E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	BNL	SHA	8.1E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	BNL	SHA	6.4E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	BNL	SHA	6.4E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	BNL	SHA	6.0E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	BNL	SHA	9.0E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	BNL	SHA	6.0E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	Charleston	SHA	3.8E-01	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	Charleston	SHA	4.0E-01	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	Charleston	SHA	4.0E-01	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	Charleston	SHA	3.7E-01	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	Charleston	SHA	5.5E-01	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	Charleston	SHA	3.7E-01	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	ETEC	SHA	8.7E-05	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	ETEC	SHA	9.6E-05	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	FEMP	SHA	1.7E-03	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	FEMP	SHA	1.0E-01	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	FEMP	SHA	1.0E-01	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	FEMP	SHA	1.1E-01	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	FEMP	SHA	3.3E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	FEMP	SHA	1.1E-01	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	GJPO	SHA	5.8E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	GJPO	SHA	6.1E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	GJPO	SHA	6.1E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	GJPO	SHA	5.7E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	GJPO	SHA	6.5E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	GJPO	SHA	5.7E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	ITRI	SHA	2.0E+00	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	KAPL-N	SHA	7.1E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	KAPL-N	SHA	7.5E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	KAPL-N	SHA	7.5E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	KAPL-N	SHA	7.0E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	KAPL-N	SHA	7.9E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	KAPL-N	SHA	7.0E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	KAPL-K	SHA	5.2E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	KAPL-K	SHA	5.4E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	KAPL-K	SHA	5.4E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120

TABLE A.1 (Cont.)

WM PEIS Alternative	Site ^a	Initial Accident ^b	Accident Frequency (1/yr)	Release Amount (g)	Chemical ^c ID	Contaminant	Toxic Gas ^d	Release Time (min)
All	KAPL-K	SHA	5.1E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	KAPL-K	SHA	5.8E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	KAPL-K	SHA	5.1E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	KAPL-W	SHA	2.4E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	KAPL-W	SHA	2.5E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	KAPL-W	SHA	2.5E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	KAPL-W	SHA	2.3E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	KAPL-W	SHA	2.6E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	KAPL-W	SHA	2.3E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	LANL	SHA	6.1E-01	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	LANL	SHA	5.8E-01	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	LBL	SHA	1.9E-01	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	LBL	SHA	1.9E-01	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	LLNL	SHA	4.9E-01	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	LLNL	SHA	5.0E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	LLNL	SHA	5.0E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	LLNL	SHA	4.7E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	LLNL	SHA	5.5E-01	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	LLNL	SHA	4.7E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	Pantex	SHA	6.0E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	Pantex	SHA	6.0E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	Pantex	SHA	6.9E-03	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	Pantex	SHA	6.9E-03	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	Pearl H	SHA	1.2E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	Ports Nav	SHA	1.2E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	Ports Nav	SHA	1.2E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	RFETS	SHA	6.8E-04	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	RFETS	SHA	1.2E-03	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	RFETS	SHA	1.2E-03	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	RFETS	SHA	1.1E-03	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	RFETS	SHA	7.5E-04	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	RFETS	SHA	1.1E-03	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	RMI	SHA	5.5E-01	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	RMI	SHA	5.5E-01	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	RMI	SHA	4.6E-02	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	RMI	SHA	4.6E-02	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	SNL-NM	SHA	1.8E-04	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	SNL-NM	SHA	2.0E-04	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	SNL-CA	SHA	1.8E+00	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	SNL-CA	SHA	1.8E+00	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60

TABLE A.1 (Cont.)

WM PEIS Alternative	Site ^a	Initial Accident ^b	Accident Frequency (1/yr)	Release Amount (g)	Chemical ^c ID	Contaminant	Toxic Gas ^d	Release Time (min)
All	SRS	SHA	3.2E-02	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	SRS	SHA	3.6E-02	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	WVDP	SHA	5.8E-01	2.7E+03	Cl-3-x	Trichloroethanes	1,1,1-C ₂ H ₃ Cl ₃	60
All	WVDP	SHA	4.7E-02	2.7E+04	Cl-3-x	Tri/tetrachloroethanes	1,1,1-C ₂ H ₃ Cl ₃	120
All	WVDP	SHA	4.7E-02	5.4E+03	Cl-4-x	Tri/tetrachloroethanes	CCl ₄	120
All	WVDP	SHA	9.9E-03	9.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	100
All	WVDP	SHA	6.6E-01	7.4E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60
All	WVDP	SHA	9.9E-03	2.7E+04	HC-soluble	Acetone/butanone/methanol	CH ₃ COCH ₃	60

^a Abbreviations: Bettis = Bettis Atomic Power Laboratory; BNL = Brookhaven National Laboratory; Charleston = Charleston Naval Shipyard; ETEC = Energy Technology Engineering Center; FEMP = Fernald Environmental Management Project; GJPO = Grand Junction Projects Office; Hanford = Hanford Site; INEL = Idaho National Engineering Laboratory; ITRI = Inhalation Toxicology Research Institute; KAPL-N = Knolls Atomic Power Laboratory (Niskayuna); KAPL-K = Knolls Atomic Power Laboratory (Kesselring); KAPL-W = Knolls Atomic Power Laboratory (Windsor); LANL = Los Alamos National Laboratory; LBL = Lawrence Berkeley National Laboratory; ORR = Oak Ridge National Laboratory; Pearl H = Pearl Harbor; PPPL = Princeton Plasma Physics Laboratory; Ports Nav = Portsmouth Naval Shipyard; RFETS = Rocky Flats Environmental Technology Site; RMI = Reactive Metals, Inc.; SNL-NM = Sandia National Laboratories (New Mexico); SNL-CA = Sandia National Laboratories (California); SRS = Savannah River Site; and WVDP = West Valley Demonstration Project.

^b SHA = single drum handling accident.

^c Cl-3-x = tri-chloro-hydrocarbons; Cl-4-x = tetra-chloro-hydrocarbons; HC-soluble = hazardous chemical-water soluble organics; HC-insoluble = hazardous chemical-water insoluble organics.

^d CH₃COCH₃ = acetone; 1,1,1-C₂H₃Cl₃ = 1,1,1-trichloroethane; CCl₄ = carbon tetrachloride; C₆H₆ = benzene; PAH soot = polyaromatic hydrocarbon soot; CO = carbon monoxide; HCl = hydrogen chloride; Cd fumes = cadmium fumes; and Cr fumes = chromium fumes.

TABLE A.2 Frequencies and Chemical Source Terms for WM-LLMW Non-Alpha Incineration Facility Accidents

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
1	INEL	IFF	1.5E-02	1.7E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
1	INEL	IFF	1.5E-02	4.8E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
1	INEL	IFF	1.5E-02	7.2E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
1	INEL	IFF	1.5E-02	7.2E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
1	INEL	IFF	1.5E-02	4.8E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
1	INEL	IFF	1.5E-02	4.8E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
1	ORR	IFF	1.5E-02	5.2E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
1	ORR	IFF	1.5E-02	1.5E+05	Cl-4-x	Benzene/toluene/xylene	HCl	30
1	ORR	IFF	1.5E-02	2.2E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
1	ORR	IFF	1.5E-02	2.2E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
1	ORR	IFF	1.5E-02	1.5E+03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
1	ORR	IFF	1.5E-02	1.5E+03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
1	SRS	IFF	1.5E-02	2.2E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
1	SRS	IFF	1.5E-02	6.4E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
1	SRS	IFF	1.5E-02	9.6E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
1	SRS	IFF	1.5E-02	9.6E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
1	SRS	IFF	1.5E-02	6.4E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
1	SRS	IFF	1.5E-02	6.4E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Ames	IFF	1.5E-02	1.6E+00	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Ames	IFF	1.5E-02	4.5E-01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Ames	IFF	1.5E-02	6.8E-02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Ames	IFF	1.5E-02	6.8E-01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Ames	IFF	1.5E-02	4.5E-03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Ames	IFF	1.5E-02	4.5E-03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	ANL-E	IFF	1.5E-02	1.6E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
2	ANL-E	IFF	1.5E-02	4.5E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	ANL-E	IFF	1.5E-02	6.7E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	ANL-E	IFF	1.5E-02	6.7E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	ANL-E	IFF	1.5E-02	4.5E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	ANL-E	IFF	1.5E-02	4.5E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Bettis	IFF	1.5E-02	2.4E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Bettis	IFF	1.5E-02	7.0E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Bettis	IFF	1.5E-02	1.0E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Bettis	IFF	1.5E-02	1.0E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Bettis	IFF	1.5E-02	7.0E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Bettis	IFF	1.5E-02	7.0E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Bettis	IFF	1.5E-02	2.8E-01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Bettis	IFF	1.5E-02	8.1E-02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Bettis	IFF	1.5E-02	1.2E-02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Bettis	IFF	1.5E-02	1.2E-01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
2	Bettis	IFF	1.5E-02	8.1E-04	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Bettis	IFF	1.5E-02	8.1E-04	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	BNL	IFF	1.5E-02	7.7E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	BNL	IFF	1.5E-02	2.2E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	BNL	IFF	1.5E-02	3.3E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	BNL	IFF	1.5E-02	3.3E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	BNL	IFF	1.5E-02	2.2E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	BNL	IFF	1.5E-02	2.2E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Charleston	IFF	1.5E-02	4.5E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Charleston	IFF	1.5E-02	1.3E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Charleston	IFF	1.5E-02	1.9E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Charleston	IFF	1.5E-02	1.9E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Charleston	IFF	1.5E-02	1.3E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Charleston	IFF	1.5E-02	1.3E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Colonie	IFF	1.5E-02	4.2E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Colonie	IFF	1.5E-02	1.2E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Colonie	IFF	1.5E-02	1.8E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Colonie	IFF	1.5E-02	1.8E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Colonie	IFF	1.5E-02	1.2E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Colonie	IFF	1.5E-02	1.2E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	ETEC	IFF	1.5E-02	7.6E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	ETEC	IFF	1.5E-02	2.2E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	ETEC	IFF	1.5E-02	3.3E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	ETEC	IFF	1.5E-02	3.3E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	ETEC	IFF	1.5E-02	2.2E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	ETEC	IFF	1.5E-02	2.2E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	FEMP	IFF	1.5E-02	1.6E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	FEMP	IFF	1.5E-02	4.6E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	FEMP	IFF	1.5E-02	6.9E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	FEMP	IFF	1.5E-02	6.9E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	FEMP	IFF	1.5E-02	4.6E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	FEMP	IFF	1.5E-02	4.6E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	GA	IFF	1.5E-02	8.0E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	GA	IFF	1.5E-02	2.3E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	GA	IFF	1.5E-02	3.4E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	GA	IFF	1.5E-02	3.4E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	GA	IFF	1.5E-02	2.3E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	GA	IFF	1.5E-02	2.3E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	GJPO	IFF	1.5E-02	6.1E+00	HC-insoluble	Benzene/toluene/xylene	CO	30
2	GJPO	IFF	1.5E-02	1.7E+00	Cl-4-x	Benzene/toluene/xylene	HCl	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
2	GJPO	IFF	1.5E-02	2.6E-01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	GJPO	IFF	1.5E-02	2.6E+00	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	GJPO	IFF	1.5E-02	1.7E-02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	GJPO	IFF	1.5E-02	1.7E-02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Hanford	IFF	1.5E-02	7.7E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Hanford	IFF	1.5E-02	2.2E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Hanford	IFF	1.5E-02	3.3E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Hanford	IFF	1.5E-02	3.3E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Hanford	IFF	1.5E-02	2.2E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Hanford	IFF	1.5E-02	2.2E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	INEL	IFF	1.5E-02	5.4E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
2	INEL	IFF	1.5E-02	1.5E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	INEL	IFF	1.5E-02	2.3E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	INEL	IFF	1.5E-02	2.3E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	INEL	IFF	1.5E-02	1.5E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	INEL	IFF	1.5E-02	1.5E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	ITRI	IFF	1.5E-02	4.7E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	ITRI	IFF	1.5E-02	1.3E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	ITRI	IFF	1.5E-02	2.0E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	ITRI	IFF	1.5E-02	2.0E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	ITRI	IFF	1.5E-02	1.3E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	ITRI	IFF	1.5E-02	1.3E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	KAPL-N	IFF	1.5E-02	7.9E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	KAPL-N	IFF	1.5E-02	2.3E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	KAPL-N	IFF	1.5E-02	3.4E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	KAPL-N	IFF	1.5E-02	3.4E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	KAPL-N	IFF	1.5E-02	2.3E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	KAPL-N	IFF	1.5E-02	2.3E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	KCP	IFF	1.5E-02	1.7E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	KCP	IFF	1.5E-02	4.9E+00	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	KCP	IFF	1.5E-02	7.4E-01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	KCP	IFF	1.5E-02	7.4E+00	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	KCP	IFF	1.5E-02	4.9E-02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	KCP	IFF	1.5E-02	4.9E-02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	KAPL-K	IFF	1.5E-02	5.9E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	KAPL-K	IFF	1.5E-02	1.7E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	KAPL-K	IFF	1.5E-02	2.5E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	KAPL-K	IFF	1.5E-02	2.5E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	KAPL-K	IFF	1.5E-02	1.7E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	KAPL-K	IFF	1.5E-02	1.7E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
2	KAPL-K	IFF	1.5E-02	3.3E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	KAPL-K	IFF	1.5E-02	9.3E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	KAPL-K	IFF	1.5E-02	1.4E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	KAPL-K	IFF	1.5E-02	1.4E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	KAPL-K	IFF	1.5E-02	9.3E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	KAPL-K	IFF	1.5E-02	9.3E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	LANL	IFF	1.5E-02	3.3E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
2	LANL	IFF	1.5E-02	9.5E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	LANL	IFF	1.5E-02	1.4E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	LANL	IFF	1.5E-02	1.4E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	LANL	IFF	1.5E-02	9.5E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	LANL	IFF	1.5E-02	9.5E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	LBL	IFF	1.5E-02	6.2E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	LBL	IFF	1.5E-02	1.8E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	LBL	IFF	1.5E-02	2.7E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	LBL	IFF	1.5E-02	2.7E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	LBL	IFF	1.5E-02	1.8E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	LBL	IFF	1.5E-02	1.8E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	LEHR	IFF	1.5E-02	1.6E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	LEHR	IFF	1.5E-02	4.6E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	LEHR	IFF	1.5E-02	7.0E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	LEHR	IFF	1.5E-02	7.0E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	LEHR	IFF	1.5E-02	4.6E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	LEHR	IFF	1.5E-02	4.6E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	LLNL	IFF	1.5E-02	3.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	LLNL	IFF	1.5E-02	1.1E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	LLNL	IFF	1.5E-02	1.7E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	LLNL	IFF	1.5E-02	1.7E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	LLNL	IFF	1.5E-02	1.1E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	LLNL	IFF	1.5E-02	1.1E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Mare Is	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Mare Is	IFF	1.5E-02	1.9E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Mare Is	IFF	1.5E-02	2.9E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Mare Is	IFF	1.5E-02	2.9E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Mare Is	IFF	1.5E-02	1.9E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Mare Is	IFF	1.5E-02	1.9E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Norfolk	IFF	1.5E-02	7.3E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Norfolk	IFF	1.5E-02	2.1E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Norfolk	IFF	1.5E-02	3.1E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Norfolk	IFF	1.5E-02	2.1E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
2	Norfolk	IFF	1.5E-02	2.1E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	ORR	IFF	1.5E-02	6.2E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
2	ORR	IFF	1.5E-02	1.8E+05	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	ORR	IFF	1.5E-02	2.6E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	ORR	IFF	1.5E-02	2.6E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	ORR	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	ORR	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	PGDP	IFF	1.5E-02	1.5E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	PGDP	IFF	1.5E-02	4.2E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	PGDP	IFF	1.5E-02	6.3E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	PGDP	IFF	1.5E-02	6.3E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	PGDP	IFF	1.5E-02	4.2E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	PGDP	IFF	1.5E-02	4.2E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Pantex	IFF	1.5E-02	1.7E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Pantex	IFF	1.5E-02	4.8E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Pantex	IFF	1.5E-02	7.2E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Pantex	IFF	1.5E-02	7.2E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Pantex	IFF	1.5E-02	4.8E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Pantex	IFF	1.5E-02	4.8E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Pearl H	IFF	1.5E-02	4.1E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Pearl H	IFF	1.5E-02	1.2E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Pearl H	IFF	1.5E-02	1.8E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	Pearl H	IFF	1.5E-02	1.8E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Pearl H	IFF	1.5E-02	1.2E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Pearl H	IFF	1.5E-02	1.2E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	PORTS	IFF	1.5E-02	1.5E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
2	PORTS	IFF	1.5E-02	4.4E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	PORTS	IFF	1.5E-02	6.5E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	PORTS	IFF	1.5E-02	6.5E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	PORTS	IFF	1.5E-02	4.4E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	PORTS	IFF	1.5E-02	4.4E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	PPPL	IFF	1.5E-02	1.0E-01	HC-insoluble	Benzene/toluene/xylene	CO	30
2	PPPL	IFF	1.5E-02	3.0E-02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	PPPL	IFF	1.5E-02	4.4E-03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	PPPL	IFF	1.5E-02	4.4E-02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	PPPL	IFF	1.5E-02	3.0E-04	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	PPPL	IFF	1.5E-02	3.0E-04	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	Puget So	IFF	1.5E-02	1.3E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
2	Puget So	IFF	1.5E-02	3.7E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	Puget So	IFF	1.5E-02	5.5E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
2	Puget So	IFF	1.5E-02	5.5E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	Puget So	IFF	1.5E-02	3.7E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	Puget So	IFF	1.5E-02	3.7E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	RMI	IFF	1.5E-02	6.9E+02	HC-insoluble	Benzene/toluene/xylene	CO	30
2	RMI	IFF	1.5E-02	2.0E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	RMI	IFF	1.5E-02	3.0E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	RMI	IFF	1.5E-02	3.0E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	RMI	IFF	1.5E-02	2.0E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	RMI	IFF	1.5E-02	2.0E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	SNL-NM	IFF	1.5E-02	1.0E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
2	SNL-NM	IFF	1.5E-02	3.0E+02	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	SNL-NM	IFF	1.5E-02	4.5E+01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	SNL-NM	IFF	1.5E-02	4.5E+02	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	SNL-NM	IFF	1.5E-02	3.0E+00	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	SNL-NM	IFF	1.5E-02	3.0E+00	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	SRS	IFF	1.5E-02	2.4E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
2	SRS	IFF	1.5E-02	6.8E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	SRS	IFF	1.5E-02	1.0E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	SRS	IFF	1.5E-02	1.0E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	ETEC	IFF	1.5E-02	7.6E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
4	ETEC	IFF	1.5E-02	2.2E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	ETEC	IFF	1.5E-02	3.3E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	ETEC	IFF	1.5E-02	3.3E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	ETEC	IFF	1.5E-02	2.2E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	ETEC	IFF	1.5E-02	2.2E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	FEMP	IFF	1.5E-02	1.8E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	FEMP	IFF	1.5E-02	5.0E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	FEMP	IFF	1.5E-02	7.6E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	FEMP	IFF	1.5E-02	7.6E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	FEMP	IFF	1.5E-02	5.0E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	FEMP	IFF	1.5E-02	5.0E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	Hanford	IFF	1.5E-02	7.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	Hanford	IFF	1.5E-02	2.2E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	Hanford	IFF	1.5E-02	3.4E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	Hanford	IFF	1.5E-02	3.4E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	Hanford	IFF	1.5E-02	2.2E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	Hanford	IFF	1.5E-02	2.2E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	INEL	IFF	1.5E-02	5.4E+03	HC-insoluble	Benzene/toluene/xylene	CO	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
4	INEL	IFF	1.5E-02	1.5E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	INEL	IFF	1.5E-02	2.3E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	INEL	IFF	1.5E-02	2.3E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	INEL	IFF	1.5E-02	1.5E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	INEL	IFF	1.5E-02	1.5E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	LANL	IFF	1.5E-02	4.4E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
4	LANL	IFF	1.5E-02	1.3E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	LANL	IFF	1.5E-02	1.9E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	LANL	IFF	1.5E-02	1.9E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	LANL	IFF	1.5E-02	1.3E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	LANL	IFF	1.5E-02	1.3E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	LLNL	IFF	1.5E-02	4.1E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	LLNL	IFF	1.5E-02	1.2E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	LLNL	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	LLNL	IFF	1.5E-02	1.8E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	LLNL	IFF	1.5E-02	1.2E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	LLNL	IFF	1.5E-02	1.2E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	ORR	IFF	1.5E-02	6.2E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
4	ORR	IFF	1.5E-02	1.8E+05	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	ORR	IFF	1.5E-02	2.7E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	ORR	IFF	1.5E-02	2.7E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	ORR	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	ORR	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	PGDP	IFF	1.5E-02	1.5E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	PGDP	IFF	1.5E-02	4.2E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	PGDP	IFF	1.5E-02	6.3E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	PGDP	IFF	1.5E-02	6.3E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	PGDP	IFF	1.5E-02	4.2E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	PGDP	IFF	1.5E-02	4.2E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	Pantex	IFF	1.5E-02	1.7E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	Pantex	IFF	1.5E-02	4.8E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	Pantex	IFF	1.5E-02	7.2E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	Pantex	IFF	1.5E-02	7.2E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	Pantex	IFF	1.5E-02	4.8E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	Pantex	IFF	1.5E-02	4.8E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	PORTS	IFF	1.5E-02	1.6E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
4	PORTS	IFF	1.5E-02	4.5E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	PORTS	IFF	1.5E-02	6.7E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	PORTS	IFF	1.5E-02	6.7E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	PORTS	IFF	1.5E-02	4.5E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
4	PORTS	IFF	1.5E-02	4.5E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	RFETS	IFF	1.5E-02	6.1E+00	HC-insoluble	Benzene/toluene/xylene	CO	30
4	RFETS	IFF	1.5E-02	1.7E+00	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	RFETS	IFF	1.5E-02	2.6E-01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	RFETS	IFF	1.5E-02	2.6E+00	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	RFETS	IFF	1.5E-02	1.7E-02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	RFETS	IFF	1.5E-02	1.7E-02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	SRS	IFF	1.5E-02	2.4E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
4	SRS	IFF	1.5E-02	6.8E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	SRS	IFF	1.5E-02	1.0E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	SRS	IFF	1.5E-02	1.0E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	Hanford	IFF	1.5E-02	1.2E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
7	Hanford	IFF	1.5E-02	3.4E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	Hanford	IFF	1.5E-02	5.1E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	Hanford	IFF	1.5E-02	5.1E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	Hanford	IFF	1.5E-02	3.4E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	Hanford	IFF	1.5E-02	3.4E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	INEL	IFF	1.5E-02	5.5E+03	HC-insoluble	Benzene/toluene/xylene	CO	30
7	INEL	IFF	1.5E-02	1.6E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	INEL	IFF	1.5E-02	2.4E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	INEL	IFF	1.5E-02	2.4E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	INEL	IFF	1.5E-02	1.6E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	INEL	IFF	1.5E-02	1.6E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	LANL	IFF	1.5E-02	2.1E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
7	LANL	IFF	1.5E-02	6.0E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	LANL	IFF	1.5E-02	9.1E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	LANL	IFF	1.5E-02	9.1E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	LANL	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	LANL	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	ORR	IFF	1.5E-02	6.3E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
7	ORR	IFF	1.5E-02	1.8E+05	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	ORR	IFF	1.5E-02	2.7E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	ORR	IFF	1.5E-02	2.7E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	ORR	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	ORR	IFF	1.5E-02	1.8E+03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	PORTS	IFF	1.5E-02	1.7E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
7	PORTS	IFF	1.5E-02	5.0E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	PORTS	IFF	1.5E-02	7.5E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
7	PORTS	IFF	1.5E-02	7.5E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	PORTS	IFF	1.5E-02	5.0E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	PORTS	IFF	1.5E-02	5.0E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	RFETS	IFF	1.5E-02	2.3E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
7	RFETS	IFF	1.5E-02	6.6E+00	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	RFETS	IFF	1.5E-02	10.0E-01	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	RFETS	IFF	1.5E-02	10.0E+00	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	RFETS	IFF	1.5E-02	6.6E-02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	RFETS	IFF	1.5E-02	6.6E-02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	SRS	IFF	1.5E-02	2.4E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
7	SRS	IFF	1.5E-02	6.8E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	SRS	IFF	1.5E-02	1.0E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	SRS	IFF	1.5E-02	1.0E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
15	Hanford	IFF	1.5E-02	1.2E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
15	Hanford	IFF	1.5E-02	3.4E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
15	Hanford	IFF	1.5E-02	5.1E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
15	Hanford	IFF	1.5E-02	5.1E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
15	Hanford	IFF	1.5E-02	3.4E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
15	Hanford	IFF	1.5E-02	3.4E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
15	INEL	IFF	1.5E-02	2.8E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
15	INEL	IFF	1.5E-02	7.6E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
15	INEL	IFF	1.5E-02	1.1E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
15	INEL	IFF	1.5E-02	1.1E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
15	INEL	IFF	1.5E-02	7.6E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
15	INEL	IFF	1.5E-02	7.6E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
15	ORR	IFF	1.5E-02	8.1E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
15	ORR	IFF	1.5E-02	2.3E+05	Cl-4-x	Benzene/toluene/xylene	HCl	30
15	ORR	IFF	1.5E-02	3.5E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
15	ORR	IFF	1.5E-02	3.5E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
15	ORR	IFF	1.5E-02	2.3E+03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
15	ORR	IFF	1.5E-02	2.3E+03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
15	SRS	IFF	1.5E-02	2.4E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
15	SRS	IFF	1.5E-02	6.8E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
15	SRS	IFF	1.5E-02	1.0E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
15	SRS	IFF	1.5E-02	1.0E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
15	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
15	SRS	IFF	1.5E-02	6.8E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
17	Hanford	IFF	1.5E-02	1.2E+06	HC-insoluble	Benzene/toluene/xylene	CO	30

TABLE A.2 (Cont.)

WM PEIS Alternative ^a	Site ^b	Initial Accident ^c	Accident Frequency (1/yr)	Release Amount (g)	Chemical ID ^d	Contaminant	Toxic Gas ^e	Release Time (min)
17	Hanford	IFF	1.5E-02	3.4E+05	Cl-4-x	Benzene/toluene/xylene	HCl	30
17	Hanford	IFF	1.5E-02	5.1E+04	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
17	Hanford	IFF	1.5E-02	5.1E+05	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
17	Hanford	IFF	1.5E-02	3.4E+03	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
17	Hanford	IFF	1.5E-02	3.4E+03	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
26	SRS	IFF	1.50E-02	7.64E+01	HC-insoluble	Benzene/toluene/xylene	CO	30
26	SRS	IFF	1.50E-02	2.18E+01	Cl-4-x	Benzene/toluene/xylene	HCl	30
26	SRS	IFF	1.50E-02	3.28E+00	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
26	SRS	IFF	1.50E-02	3.28E+01	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
26	SRS	IFF	1.50E-02	2.18E-01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
26	SRS	IFF	1.50E-02	2.18E-01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30

^a The WM PEIS cases analyzed are described as follows:

- *Case 1 (No Action)*. Three sites (INEL, ORR, and SRS) treat and store, all remaining sites store.
- *Case 2 (Decentralized)*. Forty-nine sites treat, and 16 sites dispose.
- *Case 4 (Regionalized 1)*. Eleven sites (Hanford, INEL, LANL, ORR, SRS PORTS, PGDP, FEMP, LLNL, Pantex, and RFETS) treat, and 12 sites dispose.
- *Case 7 (Regionalized 2)*. Seven sites (Hanford, INEL, LANL, ORR, SRS, PORTS, and RFETS) treat, and 6 sites dispose.
- *Case 15 (Regionalized 4)*. Four sites (Hanford, INEL, ORR, and SRS) treat, and 6 sites dispose.
- *Case 17 (Centralized)*. One site treats (Hanford) and 1 site disposes.
- *Case 26 (Remote-handled)*. Four sites (Hanford, INEL, ORR, and SRS) treat and dispose (RH) and dispose.

^b Abbreviations: Ames = Ames Laboratory; ANL-E = Argonne National Laboratory-East; GA = General Atomics; KCP = Kansas City Plant; LEHR = Laboratory for Energy-Related Health Research; Mare Is = Mare Island; Norfolk = Norfolk Naval Shipyard; PGDP = Paducah Gaseous Diffusion Plant; PORTS = Portsmouth Gaseous Diffusion Plant; and Puget So = Puget Sound.

^c IFF = incineration facility fire in the feedstock staging area.

^d Cl-4-x = tetra-chloro-hydrocarbons; and HC-insoluble = hazardous chemical-water insoluble organics.

^e C₆H₆ = benzene; PAH soot = polyaromatic hydrocarbon soot; CO = carbon monoxide; HCl = hydrogen chloride; Cd fumes = cadmium fumes; and Cr fumes = chromium fumes.

TABLE A.3 Frequencies and Chemical Source Terms for WM-LLMW Alpha Incineration Facility Accidents

WM PEIS Alternative ^a	Site	Initial Accident ^b	Accident Frequency	Release Amount (g)	Chemical ID ^c	Contaminant	Toxic Gas ^d	Release Time (min)
2	INEL	IFF	1.5E-02	6.5E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	INEL	IFF	1.5E-02	1.9E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	INEL	IFF	1.5E-02	2.8E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	INEL	IFF	1.5E-02	2.8E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	INEL	IFF	1.5E-02	1.9E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	INEL	IFF	1.5E-02	1.9E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	LANL	IFF	1.5E-02	2.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	LANL	IFF	1.5E-02	8.2E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	LANL	IFF	1.5E-02	1.2E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	LANL	IFF	1.5E-02	1.2E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	LANL	IFF	1.5E-02	8.2E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	LANL	IFF	1.5E-02	8.2E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	LLNL	IFF	1.5E-02	2.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	LLNL	IFF	1.5E-02	8.3E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	LLNL	IFF	1.5E-02	1.2E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	LLNL	IFF	1.5E-02	1.2E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	LLNL	IFF	1.5E-02	8.3E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	LLNL	IFF	1.5E-02	8.3E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	RFETS	IFF	1.5E-02	1.4E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	RFETS	IFF	1.5E-02	3.9E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	RFETS	IFF	1.5E-02	5.9E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	RFETS	IFF	1.5E-02	5.9E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	RFETS	IFF	1.5E-02	3.9E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	RFETS	IFF	1.5E-02	3.9E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
2	SRS	IFF	1.5E-02	2.1E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
2	SRS	IFF	1.5E-02	6.0E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
2	SRS	IFF	1.5E-02	9.1E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
2	SRS	IFF	1.5E-02	9.1E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
2	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
2	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	INEL	IFF	1.5E-02	6.5E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	INEL	IFF	1.5E-02	1.9E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	INEL	IFF	1.5E-02	2.8E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	INEL	IFF	1.5E-02	2.8E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	INEL	IFF	1.5E-02	1.9E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	INEL	IFF	1.5E-02	1.9E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30

TABLE A.3 (Cont.)

WM PEIS Alternative ^a	Site	Initial Accident ^b	Accident Frequency	Release Amount (g)	Chemical ID ^c	Contaminant	Toxic Gas ^d	Release Time (min)
4	LANL	IFF	1.5E-02	2.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	LANL	IFF	1.5E-02	8.2E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	LANL	IFF	1.5E-02	1.2E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	LANL	IFF	1.5E-02	1.2E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	LANL	IFF	1.5E-02	8.2E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	LANL	IFF	1.5E-02	8.2E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	LLNL	IFF	1.5E-02	2.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	LLNL	IFF	1.5E-02	8.3E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	LLNL	IFF	1.5E-02	1.2E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	LLNL	IFF	1.5E-02	1.2E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	LLNL	IFF	1.5E-02	8.3E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	LLNL	IFF	1.5E-02	8.3E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	RFETS	IFF	1.5E-02	1.4E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	RFETS	IFF	1.5E-02	3.9E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	RFETS	IFF	1.5E-02	5.9E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	RFETS	IFF	1.5E-02	5.9E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	RFETS	IFF	1.5E-02	3.9E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	RFETS	IFF	1.5E-02	3.9E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
4	SRS	IFF	1.5E-02	2.1E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
4	SRS	IFF	1.5E-02	6.0E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
4	SRS	IFF	1.5E-02	9.1E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
4	SRS	IFF	1.5E-02	9.1E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
4	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
4	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	INEL	IFF	1.5E-02	9.4E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
7	INEL	IFF	1.5E-02	2.7E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	INEL	IFF	1.5E-02	4.0E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	INEL	IFF	1.5E-02	4.0E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	INEL	IFF	1.5E-02	2.7E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	INEL	IFF	1.5E-02	2.7E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	LANL	IFF	1.5E-02	2.9E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
7	LANL	IFF	1.5E-02	8.2E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	LANL	IFF	1.5E-02	1.2E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	LANL	IFF	1.5E-02	1.2E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	LANL	IFF	1.5E-02	8.2E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	LANL	IFF	1.5E-02	8.2E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30

TABLE A.3 (Cont.)

WM PEIS Alternative ^a	Site	Initial Accident ^b	Accident Frequency	Release Amount (g)	Chemical ID ^c	Contaminant	Toxic Gas ^d	Release Time (min)
7	RFETS	IFF	1.5E-02	1.4E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
7	RFETS	IFF	1.5E-02	3.9E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	RFETS	IFF	1.5E-02	5.9E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	RFETS	IFF	1.5E-02	5.9E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	RFETS	IFF	1.5E-02	3.9E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	RFETS	IFF	1.5E-02	3.9E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
7	SRS	IFF	1.5E-02	2.1E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
7	SRS	IFF	1.5E-02	6.0E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
7	SRS	IFF	1.5E-02	9.1E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
7	SRS	IFF	1.5E-02	9.1E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
7	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
7	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
15	INEL	IFF	1.5E-02	1.4E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
15	INEL	IFF	1.5E-02	3.9E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
15	INEL	IFF	1.5E-02	5.9E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
15	INEL	IFF	1.5E-02	5.9E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
15	INEL	IFF	1.5E-02	3.9E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
15	INEL	IFF	1.5E-02	3.9E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
15	SRS	IFF	1.5E-02	2.1E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
15	SRS	IFF	1.5E-02	6.0E+03	Cl-4-x	Benzene/toluene/xylene	HCl	30
15	SRS	IFF	1.5E-02	9.1E+02	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
15	SRS	IFF	1.5E-02	9.1E+03	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
15	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
15	SRS	IFF	1.5E-02	6.0E+01	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
17	Hanford	IFF	1.5E-02	1.6E+05	HC-insoluble	Benzene/toluene/xylene	CO	30
17	Hanford	IFF	1.5E-02	4.5E+04	Cl-4-x	Benzene/toluene/xylene	HCl	30
17	Hanford	IFF	1.5E-02	6.8E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
17	Hanford	IFF	1.5E-02	6.8E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
17	Hanford	IFF	1.5E-02	4.5E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
17	Hanford	IFF	1.5E-02	4.5E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30
26	INEL	IFF	1.5E-02	3.8E+04	HC-insoluble	Benzene/toluene/xylene	CO	30
26	INEL	IFF	1.5E-02	1.1E+04	CL-4-x	Benzene/toluene/xylene	HCl	30
26	INEL	IFF	1.5E-02	1.6E+03	HC-insoluble	Benzene/toluene/xylene	C ₆ H ₆	30
26	INEL	IFF	1.5E-02	1.6E+04	HC-insoluble	Benzene/toluene/xylene	PAH soot	30
26	INEL	IFF	1.5E-02	1.1E+02	HC-insoluble	Benzene/toluene/xylene	Cd fumes	30
26	INEL	IFF	1.5E-02	1.1E+02	HC-insoluble	Benzene/toluene/xylene	Cr fumes	30

TABLE A.3 (Cont.)

^a The WM PEIS cases analyzed are described as follows:

- *Case 1 (No Action)*. Three sites (INEL, ORR, and SRS) treat and store, all remaining sites store.
- *Case 2 (Decentralized)*. Forty-nine sites treat, and 16 sites dispose.
- *Case 4 (Regionalized 1)*. Eleven sites (Hanford, INEL, LANL, ORR, SRS PORTS, PGDP, FEMP, LLNL, Pantex, and RFETS) treat, and 12 sites dispose.
- *Case 7 (Regionalized 2)*. Seven sites (Hanford, INEL, LANL, ORR, SRS, PORTS, and RFETS) treat, and 6 sites dispose.
- *Case 15 (Regionalized 4)*. Four sites (Hanford, INEL, ORR, and SRS) treat, and 6 sites dispose.
- *Case 17 (Centralized)*. One site treats (Hanford) and 1 site disposes.
- *Case 26 (Remote-handled)*. Four sites (Hanford, INEL, ORR, and SRS) treat and dispose (RH) and dispose.

^b IFF = incineration facility fire in the feedstock staging area.

^c Cl-4-x = tetra-chloro-hydrocarbons; and HC-insoluble = hazardous chemical-water insoluble organics.

^d C₆H₆ = benzene; PAH soot = polyaromatic hydrocarbon soot; CO = carbon monoxide; HCl = hydrogen chloride; Cd fumes = cadmium fumes; and Cr fumes = chromium fumes.

APPENDIX B:
RADIONUCLIDE RELEASES FROM ACCIDENTS
(RADIOLOGICAL SOURCE TERMS)

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NOTATION

The following is a list of the acronyms, initialisms, and abbreviations (including units of measure) used in this appendix.

ACRONYMS, INITIALISMS, AND ABBREVIATIONS

DOE	U.S. Department of Energy
HLW	high-level waste
LLMW	low-level mixed waste
LLW	low-level waste
PEIS	Programmatic Environmental Impact Statement
TRUW	transuranic waste
WM	Waste Management

UNITS OF MEASURE

Ci	curie(s)
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APPENDIX B:

RADIONUCLIDE RELEASES FROM ACCIDENTS (RADIOLOGICAL SOURCE TERMS)

B.1 INTRODUCTION

This appendix contains the radiological source terms for the accidents analyzed for the waste types considered in the U.S. Department of Energy (DOE) Waste Management (WM) Programmatic Environmental Impact Statement (PEIS). The source terms contain the radionuclide amounts (in curies [Ci]) released in each accident considered. Only the radionuclide distributions for the risk-dominant accidents are included in the following sections.

For inclusion in this appendix, the source terms have been organized by waste type. Section B.2 presents the source terms for high-level waste (HLW) accidents, Section B.3 for transuranic waste (TRUW) accidents, Section B.4 for low-level waste (LLW), and Sections B.5, B.6, and B.7 for low-level mixed waste (LLMW) (drum handling, alpha-waste treatment, and non-alpha waste treatment have been addressed separately).

Within each section, the radionuclide release listings are organized by WM PEIS alternative (referred to as CASE in the printouts), DOE site, and waste management function (i.e., handling, incineration, etc.), and the particular, if any, waste affected (e.g., combustible waste only, all waste, etc.). For a given WM PEIS alternative, DOE site and function, all the accident releases have been included in the same table, although they were generated separately. The column headings indicate the particular accident sequence to which the radionuclide release corresponds.

The WM PEIS alternatives covered in the source terms are the result of the WM PEIS alternative definitions and screenings that have been performed. The details are summarized in the results section for each individual waste type. The radionuclide listing, which varies from site to site and waste stream to waste stream, reflects the waste characterization determined in the WM PEIS waste management database. The DOE sites and functions appearing in the source terms are the result of the alternative definitions and the screenings performed to eliminate sites and functions with small waste volumes or low impacts.

Finally, the nomenclature for identifying the accidents sequence is as follows: XXX or XXn. Three letters (XXX) are used for single-sequence accident identification, and two letters and a single digit (XXn) are used to identify the accident initiator and the sequence number in the event tree developed for the initiator. Table B.1 summarizes the accident identification used in the source term tables.

TABLE B.1 Accident Identification

Function	Identifier	Description	Applicable Waste
Glass storage	GC1	Glass canister crush, fully filtered release	HLW
	GC3	Glass canister crush, unfiltered release	HLW
Drum handling	SHA	Single drum handling breach accident	TRUW, LLW, LLMW
Incineration ^a	IFF	Fire in the baghouse area	TRUW, LLW, LLMW
	IEX	Explosion in the rotary kiln	TRUW, LLW, LLMW
	EQ7	Earthquake followed by fire and explosion	TRUW, LLW, LLMW
	AS5	Small aircraft impact with fire and explosion	TRUW, LLW
	AL7	Large aircraft impact with fire and explosion	TRUW, LLW

^a Incineration here includes the following functions:

- Incineration of non-alpha waste (incineration),
- Incineration of non-alpha-remote-handled waste (α incineration),
- Incineration of alpha waste (α -incineration), and
- Incineration of alpha-remote-handled waste (r-incineration).

B.2 RADIONUCLIDE RELEASES FROM HLW ACCIDENTS**TABLE B.2.1 High-Level Waste, All Cases: Hanford**

Function: Glass Storage Waste Stream: All					
Nuclide	Release (Ci)		Nuclide	Release (Ci)	
	GC3	GC1		GC3	GC1
Ag-110m	1.11E-09	0.00E+00	Pu-240	1.97E-07	3.93E-13
Am-241	1.42E-04	2.84E-10	Pu-241	6.30E-08	1.26E-13
Am-242	1.10E-07	2.21E-13	Pu-242	3.81E-11	0.00E+00
Am-243	1.89E-08	3.80E-14	Rh-103m	0.00E+00	0.00E+00
C-14	0.00E+00	0.00E+00	Ru-103	0.00E+00	0.00E+00
Cd-113m	4.26E-06	8.53E-12	Ru-106	2.09E-05	4.18E-11
Cd-115m	0.00E+00	0.00E+00	Sb-124	0.00E+00	0.00E+00
Ce-141	0.00E+00	0.00E+00	Sb-125	1.27E-04	2.54E-10
Ce-144	4.00E-05	8.00E-11	Sb-126	2.55E-08	5.10E-14
Cm-242	9.10E-08	1.82E-13	Sb-126m	1.82E-07	3.65E-13
Cm-244	2.52E-06	5.03E-12	Se-79	1.57 E-09	0.00E+00
Co-60	7.50E-07	1.50E-12	Sm-151	3.49E-04	6.98E-10
Cs-134	4.66E-05	9.31E-11	Sn-113	5.10E-14	0.00E+00
Cs-135	1.01E-07	2.02E-13	Sn-119m	3.40E-09	0.00E+00
Cs-137	1.81E-02	3.61E-08	Sn-121m	3.88E-08	7.80E-14
Eu-152	7.00E-07	1.40E-12	Sn-123	1.82E-11	0.00E+00
Eu-154	7.25E-05	1.45E-10	Sn-126	1.82E-07	3.65E-13
Eu-155	6.85E-05	1.37E-10	Sr-89	0.00E+00	0.00E+00
Fe-55	9.00E-06	1.80E-11	Sr-90	1.49E-02	2.98E-08
Gd-153	6.75E-12	0.00E+00	Tb-160	0.00E+00	0.00E+00
H-3	0.00E+00	0.00E+00	Tc-99	3.75E-06	7.51E-12
I-129	1.29E-05	1.29E-05	Te-125m	3.10E-05	6.20E-11
In-113m	5.10E-14	0.00E+00	Te-127	3.27E-12	0.00E+00
Nb-93m	3.08E-07	6.16E-13	Te-127m	3.33E-12	0.00E+00
Nb-95	0.00E+00	0.00E+00	Te-129	0.00E+00	0.00E+00
Ni-59	5.45E-08	1.09E-13	Te-129m	0.00E+00	0.00E+00
Ni-63	6.05E-06	1.21E-11	U-234	2.29E-09	0.00E+00
Np-237	7.80E-08	1.56E-13	U-235	9.55E-11	0.00E+00
Pd-107	1.51E-08	3.00E-14	U-236	2.10E-10	0.00E+00
Pm-147	2.61E-03	5.21E-09	U-238	1.76E-09	0.00E+00
Pm-148m	0.00E+00	0.00E+00	Y-90	1.49E-02	2.98E-08
Pr-144	4.00E-05	8.00E-11	Y-91	0.00E+00	0.00E+00
Pr-144m	4.80E-07	9.60E-13	Zr-93	5.25E-07	1.05E-12
Pu-238	2.21E-07	4.43E-13	Zr-95	0.00E+00	0.00E+00
Pu-239	5.85E-07	1.17E-12	Total	5.14E-02	1.30E-05

TABLE B.2.2 High-Level Waste, All Cases: Savannah River Site

Function: Glass Storage					
Waste Stream: All					
Nuclide	Release (Ci)		Nuclide	Release (Ci)	
	GC3	GC1		GC3	GC1
Am-241	5.51E-06	1.10E-11	Pu-238	7.42E-04	1.48E-09
Am-242	7.18E-09	1.40E-14	Pu-239	6.46E-06	1.29E-11
Am-242m	7.24E-09	1.40E-14	Pu-240	4.34E-06	8.68E-12
Am-243	2.89E-09	0.00E+00	Pu-241	8.35E-04	1.67E-09
C-14	0.00E+00	0.00E+00	Pu-242	6.12E-09	1.20E-14
Ce-144	4.93E-03	9.87E-09	Rb-87	4.36E-13	0.00E+00
Cm-242	1.75E-08	3.50E-14	Ru-106	1.13E-03	2.25E-09
Cm-243	2.78E-09	0.00E+00	Sb-125	4.25E-04	8.50E-10
Cm-244	5.38E-05	1.08E-10	Sb-126	3.08E-08	6.20E-14
Co-60	8.50E-05	1.70E-10	Sb-126m	2.21E-07	4.42E-13
Cs-134	1.69E-04	3.37E-10	Se-79	8.50E-08	1.70E-13
Cs-135	4.97E-08	9.90E-14	Sm-151	1.24E-04	2.48E-10
Cs-137	2.17E-02	4.34E-08	Sn-121m	3.95E-08	7.90E-14
Eu-152	1.84E-06	3.69E-12	Sn-126	2.21E-07	4.42E-13
Eu-154	3.10E-04	6.20E-10	Sr-90	2.34E-02	4.67E-08
Eu-155	2.37E-04	4.75E-10	Tc-99	1.54E-06	3.08E-12
H-3	0.00E+00	0.00E+00	Te-125m	1.38E-04	2.76E-10
I-129	0.00E+00	0.00E+00	U-232	6.70E-09	1.30E-14
Nb-95	1.06E-08	2.10E-14	U-233	7.92E-13	0.00E+00
Ni-59	1.20E-08	2.40E-14	U-234	1.71E-08	3.40E-14
Ni-63	1.49E-06	2.97E-12	U-235	7.86E-11	0.00E+00
Np-237	4.45E-09	9.00E-15	U-236	5.64E-10	0.00E+00
Pd-107	7.37E-09	1.50E-14	U-238	5.25E-09	1.00E-14
Pm-147	1.21E-02	2.42E-08	Y-90	2.34E-02	4.67E-08
Pr-144	4.93E-03	9.87E-09	Zr-93	5.59E-07	1.12E-12
Pr-144m	5.94E-05	1.19E-10	Zr-95	5.03E-09	1.00E-14
Pu-236	6.11E-08	1.22E-13	Total	9.47E-02	1.89E-07

**TABLE B.2.3 High-Level Waste, All Cases: West Valley
Demonstration Project**

Function: Glass Storage Waste Stream: All					
Nuclide	Release (Ci)		Nuclide	Release (Ci)	
	GC3	GC1		GC3	GC1
Ac-225	4.13E-10	0.00E+00	Pu-236	1.65E-09	0.00E+00
Ac-227	1.61E-10	0.00E+00	Pu-238	1.63E-05	3.26E-11
Ac-228	2.99E-09	0.00E+00	Pu-239	3.20E-06	6.39E-12
Am-241	1.05E-04	2.10E-10	Pu-240	2.34E-06	4.68E-12
Am-242	5.80E-07	1.16E-12	Pu-241	1.59E-04	3.17E-10
Am-242m	5.85E-07	1.17E-12	Pu-242	3.19E-09	0.00E+00
Am-243	6.80E-07	1.36E-12	Ra-223	1.62E-08	3.20E-14
Bi-212	1.77E-08	3.50E-14	Ra-224	1.77E-08	3.50E-14
C-14	0.00E+00	0.00E+00	Ra-225	4.13E-10	0.00E+00
Cd-113m	4.17E-06	8.34E-12	Ra-228	2.99E-09	0.00E+00
Ce-144	1.28E-09	0.00E+00	Ru-106	2.77E-08	5.50E-14
Cm-242	4.82E-07	9.63E-13	Sb-125	1.43E-05	2.86E-11
Cm-243	2.64E-07	5.27E-13	Sb-126	2.87E-08	5.70E-14
Cm-244	1.50E-05	3.00E-11	Sb-126m	2.05E-07	4.09E-13
Cm-245	1.73E-09	0.00E+00	Se-79	6.90E-09	1.40E-14
Cm-246	1.96E-10	0.00E+00	Sm-151	1.66E-04	3.31E-10
Co-60	1.52E-06	3.03E-12	Sn-121m	3.43E-08	6.90E-14
Cs-134	1.02E-05	2.03E-11	Sn-126	2.05E-07	4.09E-13
Cs-135	3.17E-07	6.34E-13	Sr-90	1.32E-02	2.63E-08
Cs-137	1.42E-02	2.83E-08	Tc-99	2.14E-07	4.28E-13
Eu-152	7.15E-07	1.43E-12	Te-125m	3.50E-06	7.00E-12
Eu-154	1.88E-04	3.75E-10	Th-227	1.59E-08	3.20E-14
Eu-155	4.69E-05	9.37E-11	Th-228	1.77E-08	3.50E-14
Fe-55	1.38E-06	2.76E-12	Th-229	4.13E-10	0.00E+00
Fr-223	2.16E-10	0.00E+00	Th-230	1.18E-10	0.00E+00
H-3	0.00E+00	0.00E+00	Th-231	1.77E-10	0.00E+00
I-129	0.00E+00	0.00E+00	Th-232	3.23E-09	0.00E+00
Nb-93m	3.58E-07	7.15E-13	Th-234	1.57E-09	0.00E+00
Ni-59	2.08E-07	4.16E-13	U-232	1.36E-08	2.70E-14
Ni-63	1.51E-05	3.02E-11	U-233	1.78E-08	3.50E-14
Np-237	4.59E-08	9.20E-14	U-234	8.25E-09	1.70E-14
Np-239	6.80E-07	1.36E-12	U-235	1.77E-10	0.00E+00
Pa-231	2.99E-08	6.00E-14	U-236	5.50E-10	0.00E+00
Pa-233	4.59E-08	9.20E-14	U-238	1.57E-09	0.00E+00
Pb-212	1.77E-08	3.50E-14	Y-90	1.32E-02	2.63E-08
Pd-107	2.17E-08	4.30E-14	Zr-93	5.35E-07	1.07E-12
Pm-147	1.73E-04	3.45E-10	Total	4.14E-02	8.28E-08
Pr-144	1.28E-09	0.00E+00			

B.3 RADIONUCLIDE RELEASES FROM TRUW ACCIDENTS

(See Section 4 of main document)

B.4 RADIONUCLIDE RELEASES FROM LLW ACCIDENTS**TABLE B.4.1 Low-Level Waste, Case 1: Idaho
National Engineering Laboratory**

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	IFF	IEX	EQ7
Am-241	1.77E-08	1.77E-10	7.09E-12	1.18E-08
Ce-144	1.62E-05	1.62E-07	6.49E-09	1.08E-05
Co-58	2.43E-04	2.43E-06	9.73E-08	1.62E-04
Co-60	1.91E-03	1.91E-05	7.63E-07	1.27E-03
Cr-51	9.52E-05	9.52E-07	3.81E-08	6.35E-05
Cs-134	5.63E-06	5.63E-08	2.25E-09	3.76E-06
Cs-137	5.20E-05	5.20E-07	2.08E-08	3.47E-05
Eu-152	5.91E-09	5.91E-11	2.36E-12	3.94E-09
Eu-154	1.01E-06	1.01E-08	4.05E-10	6.76E-07
Eu-155	8.04E-07	8.04E-09	3.21E-10	5.36E-07
Fe-55	6.77E-04	6.77E-06	2.71E-07	4.51E-04
Fe-59	6.12E-06	6.12E-08	2.45E-09	4.08E-06
Mn-54	1.81E-04	1.81E-06	7.25E-08	1.21E-04
Ni-59	8.74E-06	8.74E-08	3.50E-09	5.83E-06
Ni-63	1.24E-03	1.24E-05	4.97E-07	8.28E-04
Pm-147	3.96E-05	3.96E-07	1.58E-08	2.64E-05
Pr-144	1.62E-05	1.62E-07	6.49E-09	1.08E-05
Pr-144m	1.95E-07	1.95E-09	7.80E-11	1.30E-07
Pu-238	1.22E-06	1.22E-08	4.88E-10	8.13E-07
Pu-239	1.18E-08	1.18E-10	4.73E-12	7.88E-09
Pu-240	5.91E-09	5.91E-11	2.36E-12	3.94E-09
Pu-241	1.36E-06	1.36E-08	5.46E-10	9.10E-07
Ru-106	4.84E-06	4.84E-08	1.94E-09	3.23E-06
Sb-125	1.39E-06	1.39E-08	5.57E-10	9.28E-07
Sm-151	3.87E-07	3.87E-09	1.55E-10	2.58E-07
Sr-90	4.96E-05	4.96E-07	1.99E-08	3.31E-05
Tc-99	8.86E-09	8.86E-11	3.55E-12	5.91E-09
Te-125m	3.40E-07	3.40E-09	1.36E-10	2.26E-07
Y-90	4.96E-05	4.96E-07	1.99E-08	3.31E-05
Zr-95	7.43E-06	7.43E-08	2.97E-09	4.95E-06
Total	4.61E-03	4.61E-05	1.84E-06	3.07E-03

TABLE B.4.2 Low-Level Waste, Case 1: Savannah River Site

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	IFF	IEX	EQ7	AL7
Ac-228	3.10E-08	1.24E-09	2.07E-06	3.10E-06
Am-241	8.24E-09	3.29E-10	5.49E-07	8.24E-07
Bi-212	5.18E-09	2.07E-10	3.45E-07	5.18E-07
Ce-144	7.54E-06	3.01E-07	5.02E-04	7.54E-04
Co-58	7.65E-06	3.06E-07	5.10E-04	7.65E-04
Co-60	6.01E-05	2.40E-06	4.01E-03	6.01E-03
Cr-51	2.99E-06	1.20E-07	2.00E-04	2.99E-04
Cs-134	2.62E-06	1.05E-07	1.75E-04	2.62E-04
Cs-137	2.42E-05	9.66E-07	1.61E-03	2.42E-03
Eu-152	2.75E-09	1.10E-10	1.83E-07	2.75E-07
Eu-154	4.71E-07	1.88E-08	3.14E-05	4.71E-05
Eu-155	3.73E-07	1.49E-08	2.49E-05	3.73E-05
Fe-55	2.13E-05	8.51E-07	1.42E-03	2.13E-03
Fe-59	1.92E-07	7.69E-09	1.28E-05	1.92E-05
Mn-54	5.70E-06	2.28E-07	3.80E-04	5.70E-04
Ni-59	2.75E-07	1.10E-08	1.83E-05	2.75E-05
Ni-63	3.93E-05	1.57E-06	2.62E-03	3.93E-03
Pb-212	5.18E-09	2.07E-10	3.45E-07	5.18E-07
Pm-147	1.84E-05	7.36E-07	1.23E-03	1.84E-03
Pr-144	7.54E-06	3.01E-07	5.02E-04	7.54E-04
Pr-144m	9.06E-08	3.62E-09	6.04E-06	9.06E-06
Pu-238	5.67E-07	2.27E-08	3.78E-05	5.67E-05
Pu-239	5.49E-09	2.20E-10	3.66E-07	5.49E-07
Pu-240	2.75E-09	1.10E-10	1.83E-07	2.75E-07
Pu-241	6.34E-07	2.54E-08	4.23E-05	6.34E-05
Ra-224	5.18E-09	2.07E-10	3.45E-07	5.18E-07
Ra-228	3.10E-08	1.24E-09	2.07E-06	3.10E-06
Ru-106	2.25E-06	9.00E-08	1.50E-04	2.25E-04
Sb-125	6.47E-07	2.59E-08	4.31E-05	6.47E-05
Sm-151	1.80E-07	7.19E-09	1.20E-05	1.80E-05
Sr-90	2.31E-05	9.22E-07	1.54E-03	2.31E-03
Tc-99	4.12E-09	1.65E-10	2.75E-07	4.12E-07
Te-125m	1.58E-07	6.31E-09	1.05E-05	1.58E-05
Th-228	5.18E-09	2.07E-10	3.45E-07	5.18E-07
Th-231	2.98E-08	1.19E-09	1.99E-06	2.98E-06
Th-232	3.14E-07	1.26E-08	2.10E-05	3.14E-05
Th-234	3.82E-05	1.53E-06	2.55E-03	3.82E-03
U-235	2.97E-08	1.19E-09	1.98E-06	2.97E-06
U-238	3.82E-05	1.53E-06	2.55E-03	3.82E-03
Y-90	2.31E-05	9.22E-07	1.54E-03	2.31E-03
Zr-95	2.33E-07	9.34E-09	1.56E-05	2.33E-05
Total	3.26E-04	1.31E-05	2.18E-02	3.26E-02

**TABLE B.4.3 Low-Level Waste, Case 9:
Fernald Environmental Management
Project**

Function: Incineration			
Waste Stream: Combustible			
Nuclide	Release (Ci)		
	EQ7	IFF	IEX
Ac-228	9.00E-11	1.35E-12	5.40E-14
Am-241	1.40E-11	2.10E-13	8.00E-15
Bi-212	1.40E-11	2.10E-13	8.00E-15
Cm-242	1.86E-10	2.79E-12	1.12E-13
Cm-244	6.60E-11	9.90E-13	4.00E-14
Pb-212	1.40E-11	2.10E-13	8.00E-15
Pu-238	8.72E-09	1.31E-10	5.23E-12
Pu-239	6.66E-10	9.99E-12	4.00E-13
Pu-240	2.33E-09	3.49E-11	1.40E-12
Pu-241	3.21E-07	4.82E-09	1.93E-10
Ra-224	1.40E-11	2.10E-13	8.00E-15
Ra-228	9.00E-11	1.35E-12	5.40E-14
Th-228	1.40E-11	2.10E-13	8.00E-15
Th-231	8.60E-11	1.29E-12	5.20E-14
Th-232	9.10E-10	1.36E-11	5.46E-13
Th-234	1.11E-07	1.66E-09	6.63E-11
U-235	8.60E-11	1.29E-12	5.20E-14
U-238	1.11E-07	1.66E-09	6.63E-11
Total	5.55E-07	8.33E-09	3.33E-10

TABLE B.4.4 Low-Level Waste, Case 9: Hanford

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	IFF	IEX	AL7	EQ7
Ac-228	5.67E-12	2.27E-13	5.67E-10	3.78E-10
Am-241	9.12E-10	3.65E-11	9.12E-08	6.08E-08
Bi-212	9.60E-13	3.80E-14	9.60E-11	6.40E-11
Ce-144	8.35E-07	3.34E-08	8.35E-05	5.56E-05
Co-58	1.91E-07	7.65E-09	1.91E-05	1.28E-05
Co-60	1.51E-06	6.06E-08	1.51E-04	1.01E-04
Cr-51	7.49E-08	3.00E-09	7.49E-06	4.99E-06
Cs-134	2.90E-07	1.16E-08	2.90E-05	1.93E-05
Cs-137	2.68E-06	1.07E-07	2.68E-04	1.78E-04
Eu-152	3.04E-10	1.22E-11	3.04E-08	2.03E-08
Eu-154	5.21E-08	2.09E-09	5.21E-06	3.48E-06
Eu-155	4.13E-08	1.65E-09	4.13E-06	2.76E-06
Fe-55	5.32E-07	2.13E-08	5.32E-05	3.55E-05
Fe-59	4.81E-09	1.92E-10	4.81E-07	3.21E-07
Mn-54	1.43E-07	5.70E-09	1.43E-05	9.50E-06
Ni-59	6.87E-09	2.75E-10	6.87E-07	4.58E-07
Ni-63	1.01E-06	4.02E-08	1.01E-04	6.70E-05
Pb-212	9.60E-13	3.80E-14	9.60E-11	6.40E-11
Pm-147	2.04E-06	8.15E-08	2.04E-04	1.36E-04
Pr-144	8.35E-07	3.34E-08	8.35E-05	5.56E-05
Pr-144m	1.00E-08	4.01E-10	1.00E-06	6.69E-07
Pu-238	6.28E-08	2.51E-09	6.28E-06	4.19E-06
Pu-239	6.08E-10	2.43E-11	6.08E-08	4.05E-08
Pu-240	3.04E-10	1.22E-11	3.04E-08	2.03E-08
Pu-241	7.02E-08	2.81E-09	7.02E-06	4.68E-06
Ra-224	9.60E-13	3.80E-14	9.60E-11	6.40E-11
Ra-228	5.67E-12	2.27E-13	5.67E-10	3.78E-10
Ru-106	2.49E-07	9.97E-09	2.49E-05	1.66E-05
Sb-125	7.16E-08	2.86E-09	7.16E-06	4.77E-06
Sm-151	1.99E-08	7.97E-10	1.99E-06	1.33E-06
Sr-90	2.55E-06	1.02E-07	2.55E-04	1.70E-04
Tc-99	4.56E-10	1.82E-11	4.56E-08	3.04E-08
Te-125m	1.75E-08	6.99E-10	1.75E-06	1.17E-06
Th-228	9.60E-13	3.80E-14	9.60E-11	6.40E-11
Th-231	5.46E-12	2.18E-13	5.46E-10	3.64E-10
Th-232	5.75E-11	2.30E-12	5.75E-09	3.83E-09
Th-234	6.99E-09	2.80E-10	6.99E-07	4.66E-07
U-235	5.43E-12	2.17E-13	5.43E-10	3.62E-10
U-238	6.99E-09	2.80E-10	6.99E-07	4.66E-07
Y-90	2.55E-06	1.02E-07	2.55E-04	1.70E-04
Zr-95	5.84E-09	2.34E-10	5.84E-07	3.89E-07
Total	1.59E-05	6.35E-07	1.59E-03	1.06E-03

**TABLE B.4.5 Low-Level Waste, Case 9: Idaho
National Engineering Laboratory**

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	EQ7	IFF	IEX
Am-241	1.77E-08	1.18E-08	1.77E-10	7.09E-12
Ce-144	1.62E-05	1.08E-05	1.62E-07	6.49E-09
Co-58	2.43E-04	1.62E-04	2.43E-06	9.73E-08
Co-60	1.91E-03	1.27E-03	1.91E-05	7.63E-07
Cr-51	9.52E-05	6.35E-05	9.52E-07	3.81E-08
Cs-134	5.63E-06	3.76E-06	5.63E-08	2.25E-09
Cs-137	5.20E-05	3.47E-05	5.20E-07	2.08E-08
Eu-152	5.91E-09	3.94E-09	5.91E-11	2.36E-12
Eu-154	1.01E-06	6.76E-07	1.01E-08	4.05E-10
Eu-155	8.04E-07	5.36E-07	8.04E-09	3.21E-10
Fe-55	6.77E-04	4.51E-04	6.77E-06	2.71E-07
Fe-59	6.12E-06	4.08E-06	6.12E-08	2.45E-09
Mn-54	1.81E-04	1.21E-04	1.81E-06	7.25E-08
Ni-59	8.74E-06	5.83E-06	8.74E-08	3.50E-09
Ni-63	1.24E-03	8.28E-04	1.24E-05	4.97E-07
Pm-147	3.96E-05	2.64E-05	3.96E-07	1.58E-08
Pr-144	1.62E-05	1.08E-05	1.62E-07	6.49E-09
Pr-144m	1.95E-07	1.30E-07	1.95E-09	7.80E-11
Pu-238	1.22E-06	8.13E-07	1.22E-08	4.88E-10
Pu-239	1.18E-08	7.88E-09	1.18E-10	4.73E-12
Pu-240	5.91E-09	3.94E-09	5.91E-11	2.36E-12
Pu-241	1.36E-06	9.10E-07	1.36E-08	5.46E-10
Ru-106	4.84E-06	3.23E-06	4.84E-08	1.94E-09
Sb-125	1.39E-06	9.28E-07	1.39E-08	5.57E-10
Sm-151	3.87E-07	2.58E-07	3.87E-09	1.55E-10
Sr-90	4.96E-05	3.31E-05	4.96E-07	1.99E-08
Tc-99	8.86E-09	5.91E-09	8.86E-11	3.55E-12
Te-125m	3.40E-07	2.26E-07	3.40E-09	1.36E-10
Y-90	4.96E-05	3.31E-05	4.96E-07	1.99E-08
Zr-95	7.43E-06	4.95E-06	7.43E-08	2.97E-09
Total	4.61E-03	3.07E-03	4.61E-05	1.84E-06

**TABLE B.4.6 Low-Level Waste, Case 9:
Lawrence Livermore National Laboratory**

Function: Incineration Waste Stream: Combustible			
Nuclide	Release (Ci)		
	EQ7	IFF	IEX
Ac-228	1.69E-08	2.54E-10	1.02E-11
Am-241	1.00E-09	1.50E-11	6.00E-13
Bi-212	2.83E-09	4.25E-11	1.70E-12
Ce-144	5.49E-07	8.23E-09	3.29E-10
Cm-242	5.60E-09	8.40E-11	3.36E-12
Cm-244	2.00E-09	3.00E-11	1.20E-12
Co-60	2.52E-03	3.78E-05	1.51E-06
Cs-134	1.91E-07	2.86E-09	1.14E-10
Cs-137	4.38E-03	6.56E-05	2.63E-06
Eu-152	2.00E-10	3.00E-12	1.20E-13
Eu-154	3.43E-08	5.14E-10	2.06E-11
Eu-155	2.72E-08	4.08E-10	1.63E-11
Fe-55	6.29E-05	9.44E-07	3.78E-08
Ni-63	1.89E-08	2.83E-10	1.13E-11
P-32	5.25E-03	7.87E-05	3.15E-06
Pb-212	2.83E-09	4.25E-11	1.70E-12
Pm-147	1.34E-06	2.01E-08	8.04E-10
Pr-144	5.49E-07	8.23E-09	3.29E-10
Pr-144m	6.60E-09	9.90E-11	3.96E-12
Pu-238	3.03E-07	4.55E-09	1.82E-10
Pu-239	2.04E-08	3.06E-10	1.22E-11
Pu-240	7.02E-08	1.05E-09	4.21E-11
Pu-241	9.69E-06	1.45E-07	5.81E-09
Ra-224	2.83E-09	4.25E-11	1.70E-12
Ra-228	1.69E-08	2.54E-10	1.02E-11
Ru-106	1.64E-07	2.46E-09	9.84E-11
S-35	4.51E-03	6.77E-05	2.71E-06
Sb-125	4.71E-08	7.06E-10	2.83E-11
Sm-151	1.31E-08	1.96E-10	7.86E-12
Sr-90	1.68E-06	2.52E-08	1.01E-09
Tc-99	3.00E-10	4.50E-12	1.80E-13
Te-125m	1.15E-08	1.72E-10	6.90E-12
Th-228	2.83E-09	4.25E-11	1.70E-12
Th-231	1.63E-08	2.44E-10	9.78E-12
Th-232	1.20E-03	1.80E-05	7.19E-07
Th-234	2.09E-05	3.13E-07	1.25E-08
U-235	1.62E-08	2.44E-10	9.74E-12
U-238	1.64E-03	2.46E-05	9.83E-07
Y-90	1.68E-06	2.52E-08	1.01E-09
Total	1.96E-02	2.94E-04	1.18E-05

**TABLE B.4.7 Low-Level Waste, Case 9:
Los Alamos National Laboratory**

Function: Incineration Waste Stream: Combustible			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	5.28E-05	3.17E-08	7.92E-07
Am-241	3.40E-06	2.04E-09	5.11E-08
Bi-212	8.83E-06	5.30E-09	1.32E-07
Ce-144	1.87E-03	1.12E-06	2.80E-05
Cm-242	1.91E-05	1.14E-08	2.86E-07
Cm-244	6.81E-06	4.09E-09	1.02E-07
Co-58	2.37E-06	1.42E-09	3.56E-08
Co-60	5.09E-05	3.05E-08	7.63E-07
Cr-51	9.28E-07	5.57E-10	1.39E-08
Cs-134	6.49E-04	3.89E-07	9.73E-06
Cs-137	5.99E-03	3.59E-06	8.98E-05
Eu-152	6.80E-07	4.08E-10	1.02E-08
Eu-154	1.17E-04	7.00E-08	1.75E-06
Eu-155	9.25E-05	5.55E-08	1.39E-06
Fe-55	6.59E-06	3.96E-09	9.89E-08
Fe-59	5.96E-08	3.57E-11	8.94E-10
Mn-54	1.77E-06	1.06E-09	2.65E-08
Ni-59	8.51E-08	5.11E-11	1.28E-09
Ni-63	7.64E-05	4.58E-08	1.15E-06
Pb-212	8.83E-06	5.30E-09	1.32E-07
Pm-147	4.56E-03	2.73E-06	6.84E-05
Pr-144	1.87E-03	1.12E-06	2.80E-05
Pr-144m	2.24E-05	1.35E-08	3.37E-07
Pu-238	1.03E-03	6.20E-07	1.55E-05
Pu-239	6.95E-05	4.17E-08	1.04E-06
Pu-240	2.39E-04	1.43E-07	3.59E-06
Pu-241	3.30E-02	1.98E-05	4.95E-04
Ra-224	8.83E-06	5.30E-09	1.32E-07
Ra-228	5.28E-05	3.17E-08	7.92E-07
Ru-106	5.58E-04	3.35E-07	8.37E-06
Sb-125	1.60E-04	9.61E-08	2.40E-06
Sm-151	4.46E-05	2.67E-08	6.68E-07
Sr-90	5.71E-03	3.43E-06	8.57E-05
Tc-99	1.02E-06	6.12E-10	1.53E-08
Te-125m	3.91E-05	2.35E-08	5.87E-07
Th-228	8.83E-06	5.30E-09	1.32E-07
Th-231	5.08E-05	3.05E-08	7.62E-07
Th-232	5.36E-04	3.21E-07	8.03E-06
Th-234	6.51E-02	3.91E-05	9.77E-04
U-235	5.06E-05	3.04E-08	7.59E-07
U-238	6.51E-02	3.91E-05	9.77E-04
Y-90	5.71E-03	3.43E-06	8.57E-05
Zr-95	7.23E-08	4.34E-11	1.09E-09
Total	1.93E-01	1.16E-04	2.89E-03

**TABLE B.4.8 Low-Level Waste, Case 9:
Oak Ridge National Laboratory**

Function: Incineration			
Waste Stream: Combustible			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	2.40E-11	1.40E-14	3.60E-13
Bi-212	4.00E-12	0.00E+00	6.00E-14
Co-60	4.16E-05	2.50E-08	6.24E-07
Cs-137	7.40E-05	4.44E-08	1.11E-06
P-32	8.88E-05	5.33E-08	1.33E-06
Pb-212	4.00E-12	0.00E+00	6.00E-14
Ra-224	4.00E-12	0.00E+00	6.00E-14
Ra-228	2.40E-11	1.40E-14	3.60E-13
S-35	7.64E-05	4.58E-08	1.15E-06
Sr-90	3.17E-05	1.90E-08	4.76E-07
Th-228	4.00E-12	0.00E+00	6.00E-14
Th-231	2.40E-11	1.40E-14	3.60E-13
Th-232	2.03E-05	1.22E-08	3.04E-07
Th-234	3.05E-08	1.83E-11	4.58E-10
U-235	2.40E-11	1.40E-14	3.60E-13
U-238	2.74E-05	1.64E-08	4.11E-07
Y-90	3.17E-05	1.90E-08	4.76E-07
Total	3.92E-04	2.35E-07	5.88E-06

**TABLE B.4.9 Low-Level Waste, Case 9: Paducah
Gaseous Diffusion Plant**

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AS5	EQ7	IEX	IFF
Ac-228	3.02E-09	1.21E-08	7.24E-12	1.81E-10
Bi-212	5.04E-10	2.02E-09	1.21E-12	3.03E-11
Np-237	3.40E-08	1.36E-07	8.16E-11	2.04E-09
Pb-212	5.04E-10	2.02E-09	1.21E-12	3.03E-11
Pu-239	3.40E-08	1.36E-07	8.16E-11	2.04E-09
Ra-224	5.04E-10	2.02E-09	1.21E-12	3.03E-11
Ra-228	3.02E-09	1.21E-08	7.24E-12	1.81E-10
Tc-99	4.53E-08	1.81E-07	1.09E-10	2.72E-09
Th-228	5.04E-10	2.02E-09	1.21E-12	3.03E-11
Th-231	2.90E-09	1.16E-08	6.97E-12	1.74E-10
Th-232	3.06E-08	1.22E-07	7.35E-11	1.84E-09
Th-234	3.72E-06	1.49E-05	8.93E-09	2.23E-07
U-235	2.89E-09	1.16E-08	6.94E-12	1.74E-10
U-238	3.72E-06	1.49E-05	8.93E-09	2.23E-07
Total	7.60E-06	3.04E-05	1.82E-08	4.56E-07

**TABLE B.4.10 Low-Level Waste, Case 9:
Portsmouth Gaseous Diffusion Plant**

Function: Incineration			
Waste Stream: Combustible			
Nuclide	Release (Ci)		
	EQ7	IFF	IEX
Ac-228	1.42E-09	2.13E-11	8.52E-13
Bi-212	2.38E-10	3.57E-12	1.43E-13
Pb-212	2.38E-10	3.57E-12	1.43E-13
Ra-224	2.38E-10	3.57E-12	1.43E-13
Ra-228	1.42E-09	2.13E-11	8.52E-13
Th-228	2.38E-10	3.57E-12	1.43E-13
Th-231	1.37E-09	2.05E-11	8.21E-13
Th-232	1.44E-08	2.16E-10	8.65E-12
Th-234	1.75E-06	2.63E-08	1.05E-09
U-235	1.36E-09	2.04E-11	8.17E-13
U-238	1.75E-06	2.63E-08	1.05E-09
Total	3.53E-06	5.29E-08	2.12E-09

**TABLE B.4.11 Low-Level Waste, Case 9: Rocky
Flats Environmental Technology Site**

Function: a-Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AS5	EQ7	IFF	IEX
Ac-228	1.94E-08	7.77E-08	1.17E-09	4.66E-11
Am-241	2.89E-08	1.15E-07	1.73E-09	6.93E-11
Bi-212	3.25E-09	1.30E-08	1.95E-10	7.80E-12
Cm-242	4.04E-07	1.62E-06	2.43E-08	9.70E-10
Cm-244	1.44E-07	5.77E-07	8.66E-09	3.46E-10
Pb-212	3.25E-09	1.30E-08	1.95E-10	7.80E-12
Pu-238	1.89E-05	7.56E-05	1.13E-06	4.54E-08
Pu-239	1.44E-06	5.77E-06	8.66E-08	3.46E-09
Pu-240	5.05E-06	2.02E-05	3.03E-07	1.21E-08
Pu-241	6.96E-04	2.78E-03	4.18E-05	1.67E-06
Ra-224	3.25E-09	1.30E-08	1.95E-10	7.80E-12
Ra-228	1.94E-08	7.77E-08	1.17E-09	4.66E-11
Th-228	3.25E-09	1.30E-08	1.95E-10	7.80E-12
Th-231	1.87E-08	7.48E-08	1.12E-09	4.49E-11
Th-232	1.97E-07	7.88E-07	1.18E-08	4.73E-10
Th-234	2.40E-05	9.59E-05	1.44E-06	5.75E-08
U-235	1.86E-08	7.45E-08	1.12E-09	4.47E-11
U-238	2.40E-05	9.59E-05	1.44E-06	5.75E-08
Total	7.70E-04	3.08E-03	4.62E-05	1.85E-06

TABLE B.4.12 Low-Level Waste, Case 9: Savannah River Site

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	EQ7	IFF	IEX
Ac-228	3.10E-06	2.07E-06	3.10E-08	1.24E-09
Am-241	8.24E-07	5.49E-07	8.24E-09	3.29E-10
Bi-212	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Ce-144	7.54E-04	5.02E-04	7.54E-06	3.01E-07
Co-58	7.65E-04	5.10E-04	7.65E-06	3.06E-07
Co-60	6.01E-03	4.01E-03	6.01E-05	2.40E-06
Cr-51	2.99E-04	2.00E-04	2.99E-06	1.20E-07
Cs-134	2.62E-04	1.75E-04	2.62E-06	1.05E-07
Cs-137	2.42E-03	1.61E-03	2.42E-05	9.66E-07
Eu-152	2.75E-07	1.83E-07	2.75E-09	1.10E-10
Eu-154	4.71E-05	3.14E-05	4.71E-07	1.88E-08
Eu-155	3.73E-05	2.49E-05	3.73E-07	1.49E-08
Fe-55	2.13E-03	1.42E-03	2.13E-05	8.51E-07
Fe-59	1.92E-05	1.28E-05	1.92E-07	7.69E-09
Mn-54	5.70E-04	3.80E-04	5.70E-06	2.28E-07
Ni-59	2.75E-05	1.83E-05	2.75E-07	1.10E-08
Ni-63	3.93E-03	2.62E-03	3.93E-05	1.57E-06
Pb-212	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Pm-147	1.84E-03	1.23E-03	1.84E-05	7.36E-07
Pr-144	7.54E-04	5.02E-04	7.54E-06	3.01E-07
Pr-144m	9.06E-06	6.04E-06	9.06E-08	3.62E-09
Pu-238	5.67E-05	3.78E-05	5.67E-07	2.27E-08
Pu-239	5.49E-07	3.66E-07	5.49E-09	2.20E-10
Pu-240	2.75E-07	1.83E-07	2.75E-09	1.10E-10
Pu-241	6.34E-05	4.23E-05	6.34E-07	2.54E-08
Ra-224	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Ra-228	3.10E-06	2.07E-06	3.10E-08	1.24E-09
Ru-106	2.25E-04	1.50E-04	2.25E-06	9.00E-08
Sb-125	6.47E-05	4.31E-05	6.47E-07	2.59E-08
Sm-151	1.80E-05	1.20E-05	1.80E-07	7.19E-09
Sr-90	2.31E-03	1.54E-03	2.31E-05	9.22E-07
Tc-99	4.12E-07	2.75E-07	4.12E-09	1.65E-10
Te-125m	1.58E-05	1.05E-05	1.58E-07	6.31E-09
Th-228	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Th-231	2.98E-06	1.99E-06	2.98E-08	1.19E-09
Th-232	3.14E-05	2.10E-05	3.14E-07	1.26E-08
Th-234	3.82E-03	2.55E-03	3.82E-05	1.53E-06
U-235	2.97E-06	1.98E-06	2.97E-08	1.19E-09
U-238	3.82E-03	2.55E-03	3.82E-05	1.53E-06
Y-90	2.31E-03	1.54E-03	2.31E-05	9.22E-07
Zr-95	2.33E-05	1.56E-05	2.33E-07	9.34E-09
Total	3.26E-02	2.18E-02	3.26E-04	1.31E-05

TABLE B.4.13 Low-Level Waste, Case 12: Hanford

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	EQ7	IEX	IFF
Ac-228	2.60E-08	1.73E-08	1.04E-11	2.60E-10
Am-241	9.27E-08	6.18E-08	3.71E-11	9.27E-10
Bi-212	4.34E-09	2.90E-09	1.74E-12	4.34E-11
Ce-144	8.43E-05	5.62E-05	3.37E-08	8.43E-07
Cm-242	8.40E-09	5.60E-09	3.36E-12	8.40E-11
Cm-244	3.00E-09	2.00E-09	1.20E-12	3.00E-11
Co-58	1.91E-05	1.28E-05	7.65E-09	1.91E-07
Co-60	3.93E-03	2.62E-03	1.57E-06	3.93E-05
Cr-51	7.49E-06	4.99E-06	3.00E-09	7.49E-08
Cs-134	2.93E-05	1.95E-05	1.17E-08	2.93E-07
Cs-137	6.83E-03	4.55E-03	2.73E-06	6.83E-05
Eu-152	3.07E-08	2.05E-08	1.23E-11	3.07E-10
Eu-154	5.27E-06	3.51E-06	2.11E-09	5.27E-08
Eu-155	4.18E-06	2.78E-06	1.67E-09	4.18E-08
Fe-55	1.48E-04	9.84E-05	5.90E-08	1.48E-06
Fe-59	4.81E-07	3.21E-07	1.92E-10	4.81E-09
Mn-54	1.43E-05	9.50E-06	5.70E-09	1.43E-07
Ni-59	6.87E-07	4.58E-07	2.75E-10	6.87E-09
Ni-63	1.01E-04	6.70E-05	4.02E-08	1.01E-06
P-32	7.87E-03	5.25E-03	3.15E-06	7.87E-05
Pb-212	4.34E-09	2.90E-09	1.74E-12	4.34E-11
Pm-147	2.06E-04	1.37E-04	8.23E-08	2.06E-06
Pr-144	8.43E-05	5.62E-05	3.37E-08	8.43E-07
Pr-144m	1.01E-06	6.75E-07	4.05E-10	1.01E-08
Pu-238	6.73E-06	4.49E-06	2.69E-09	6.73E-08
Pu-239	9.14E-08	6.09E-08	3.66E-11	9.14E-10
Pu-240	1.36E-07	9.05E-08	5.43E-11	1.36E-09
Pu-241	2.16E-05	1.44E-05	8.62E-09	2.16E-07
Ra-224	4.34E-09	2.90E-09	1.74E-12	4.34E-11
Ra-228	2.60E-08	1.73E-08	1.04E-11	2.60E-10
Ru-106	2.52E-05	1.68E-05	1.01E-08	2.52E-07
S-35	6.77E-03	4.51E-03	2.71E-06	6.77E-05
Sb-125	7.23E-06	4.82E-06	2.89E-09	7.23E-08
Sm-151	2.01E-06	1.34E-06	8.04E-10	2.01E-08
Sr-90	2.58E-04	1.72E-04	1.03E-07	2.58E-06
Tc-99	4.61E-08	3.07E-08	1.84E-11	4.61E-10
Te-125m	1.77E-06	1.18E-06	7.06E-10	1.77E-08
Th-228	4.34E-09	2.90E-09	1.74E-12	4.34E-11
Th-231	2.50E-08	1.67E-08	1.00E-11	2.50E-10
Th-232	1.80E-03	1.20E-03	7.19E-07	1.80E-05
Th-234	3.20E-05	2.14E-05	1.28E-08	3.20E-07
U-235	2.49E-08	1.66E-08	9.96E-12	2.49E-10
U-238	2.46E-03	1.64E-03	9.84E-07	2.46E-05
Y-90	2.58E-04	1.72E-04	1.03E-07	2.58E-06
Zr-95	5.84E-07	3.89E-07	2.34E-10	5.84E-09
Total	3.10E-02	2.07E-02	1.24E-05	3.10E-04

**TABLE B.4.14 Low-Level Waste, Case 12: Idaho
National Engineering Laboratory**

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	IEX	IFF	EQ7
Am-241	1.77E-08	7.09E-12	1.77E-10	1.18E-08
Ce-144	1.62E-05	6.49E-09	1.62E-07	1.08E-05
Co-58	2.43E-04	9.73E-08	2.43E-06	1.62E-04
Co-60	1.91E-03	7.63E-07	1.91E-05	1.27E-03
Cr-51	9.52E-05	3.81E-08	9.52E-07	6.35E-05
Cs-134	5.63E-06	2.25E-09	5.63E-08	3.76E-06
Cs-137	5.20E-05	2.08E-08	5.20E-07	3.47E-05
Eu-152	5.91E-09	2.36E-12	5.91E-11	3.94E-09
Eu-154	1.01E-06	4.05E-10	1.01E-08	6.76E-07
Eu-155	8.04E-07	3.21E-10	8.04E-09	5.36E-07
Fe-55	6.77E-04	2.71E-07	6.77E-06	4.51E-04
Fe-59	6.12E-06	2.45E-09	6.12E-08	4.08E-06
Mn-54	1.81E-04	7.25E-08	1.81E-06	1.21E-04
Ni-59	8.74E-06	3.50E-09	8.74E-08	5.83E-06
Ni-63	1.24E-03	4.97E-07	1.24E-05	8.28E-04
Pm-147	3.96E-05	1.58E-08	3.96E-07	2.64E-05
Pr-144	1.62E-05	6.49E-09	1.62E-07	1.08E-05
Pr-144m	1.95E-07	7.80E-11	1.95E-09	1.30E-07
Pu-238	1.22E-06	4.88E-10	1.22E-08	8.13E-07
Pu-239	1.18E-08	4.73E-12	1.18E-10	7.88E-09
Pu-240	5.91E-09	2.36E-12	5.91E-11	3.94E-09
Pu-241	1.36E-06	5.46E-10	1.36E-08	9.10E-07
Ru-106	4.84E-06	1.94E-09	4.84E-08	3.23E-06
Sb-125	1.39E-06	5.57E-10	1.39E-08	9.28E-07
Sm-151	3.87E-07	1.55E-10	3.87E-09	2.58E-07
Sr-90	4.96E-05	1.99E-08	4.96E-07	3.31E-05
Tc-99	8.86E-09	3.55E-12	8.86E-11	5.91E-09
Te-125m	3.40E-07	1.36E-10	3.40E-09	2.26E-07
Y-90	4.96E-05	1.99E-08	4.96E-07	3.31E-05
Zr-95	7.43E-06	2.97E-09	7.43E-08	4.95E-06
Total	4.61E-03	1.84E-06	4.61E-05	3.07E-03

**TABLE B.4.15 Low-Level Waste, Case 12:
Los Alamos National Laboratory**

Function: Incineration Waste Stream: Combustible			
Nuclide	Release (Ci)		
	IFF	IEX	EQ7
Ac-228	7.92E-07	3.17E-08	5.28E-05
Am-241	5.11E-08	2.04E-09	3.40E-06
Bi-212	1.32E-07	5.30E-09	8.83E-06
Ce-144	2.80E-05	1.12E-06	1.87E-03
Cm-242	2.86E-07	1.14E-08	1.91E-05
Cm-244	1.02E-07	4.09E-09	6.81E-06
Co-58	3.56E-08	1.42E-09	2.37E-06
Co-60	7.63E-07	3.05E-08	5.09E-05
Cr-51	1.39E-08	5.57E-10	9.28E-07
Cs-134	9.73E-06	3.89E-07	6.49E-04
Cs-137	8.98E-05	3.59E-06	5.99E-03
Eu-152	1.02E-08	4.08E-10	6.80E-07
Eu-154	1.75E-06	7.00E-08	1.17E-04
Eu-155	1.39E-06	5.55E-08	9.25E-05
Fe-55	9.89E-08	3.96E-09	6.59E-06
Fe-59	8.94E-10	3.57E-11	5.96E-08
Mn-54	2.65E-08	1.06E-09	1.77E-06
Ni-59	1.28E-09	5.11E-11	8.51E-08
Ni-63	1.15E-06	4.58E-08	7.64E-05
Pb-212	1.32E-07	5.30E-09	8.83E-06
Pm-147	6.84E-05	2.73E-06	4.56E-03
Pr-144	2.80E-05	1.12E-06	1.87E-03
Pr-144m	3.37E-07	1.35E-08	2.24E-05
Pu-238	1.55E-05	6.20E-07	1.03E-03
Pu-239	1.04E-06	4.17E-08	6.95E-05
Pu-240	3.59E-06	1.43E-07	2.39E-04
Pu-241	4.95E-04	1.98E-05	3.30E-02
Ra-224	1.32E-07	5.30E-09	8.83E-06
Ra-228	7.92E-07	3.17E-08	5.28E-05
Ru-106	8.37E-06	3.35E-07	5.58E-04
Sb-125	2.40E-06	9.61E-08	1.60E-04
Sm-151	6.68E-07	2.67E-08	4.46E-05
Sr-90	8.57E-05	3.43E-06	5.71E-03
Tc-99	1.53E-08	6.12E-10	1.02E-06
Te-125m	5.87E-07	2.35E-08	3.91E-05
Th-228	1.32E-07	5.30E-09	8.83E-06
Th-231	7.62E-07	3.05E-08	5.08E-05
Th-232	8.03E-06	3.21E-07	5.36E-04
Th-234	9.77E-04	3.91E-05	6.51E-02
U-235	7.59E-07	3.04E-08	5.06E-05
U-238	9.77E-04	3.91E-05	6.51E-02
Y-90	8.57E-05	3.43E-06	5.71E-03
Zr-95	1.09E-09	4.34E-11	7.23E-08
Total	2.89E-03	1.16E-04	1.93E-01

**TABLE B.4.16 Low-Level Waste, Case 12:
Oak Ridge National Laboratory**

Function: Incineration			
Waste Stream: Combustible			
Nuclide	Release (Ci)		
	IFF	IEX	EQ7
Ac-228	2.02E-10	8.08E-12	1.35E-08
Bi-212	3.38E-11	1.35E-12	2.25E-09
Co-60	6.24E-07	2.50E-08	4.16E-05
Cs-137	1.11E-06	4.44E-08	7.40E-05
Np-237	2.04E-09	8.16E-11	1.36E-07
P-32	1.33E-06	5.33E-08	8.88E-05
Pb-212	3.38E-11	1.35E-12	2.25E-09
Pu-239	2.04E-09	8.16E-11	1.36E-07
Ra-224	3.38E-11	1.35E-12	2.25E-09
Ra-228	2.02E-10	8.08E-12	1.35E-08
S-35	1.15E-06	4.58E-08	7.64E-05
Sr-90	4.76E-07	1.90E-08	3.17E-05
Tc-99	2.72E-09	1.09E-10	1.81E-07
Th-228	3.38E-11	1.35E-12	2.25E-09
Th-231	1.95E-10	7.79E-12	1.30E-08
Th-232	3.06E-07	1.22E-08	2.04E-05
Th-234	2.49E-07	9.98E-09	1.66E-05
U-235	1.94E-10	7.75E-12	1.29E-08
U-238	6.60E-07	2.64E-08	4.40E-05
Y-90	4.76E-07	1.90E-08	3.17E-05
Total	6.39E-06	2.55E-07	4.26E-04

**TABLE B.4.17 Low-Level Waste, Case 12: Portsmouth
Gaseous Diffusion Plant**

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AS5	IEX	IFF	EQ7
Ac-228	3.15E-11	7.60E-14	1.89E-12	1.26E-10
Am-241	3.50E-12	8.00E-15	2.10E-13	1.40E-11
Bi-212	5.00E-12	1.20E-14	3.00E-13	2.00E-11
Cm-242	4.65E-11	1.12E-13	2.79E-12	1.86E-10
Cm-244	1.65E-11	4.00E-14	9.90E-13	6.60E-11
Pb-212	5.00E-12	1.20E-14	3.00E-13	2.00E-11
Pu-238	2.18E-09	5.23E-12	1.31E-10	8.72E-09
Pu-239	1.66E-10	4.00E-13	9.99E-12	6.66E-10
Pu-240	5.82E-10	1.40E-12	3.49E-11	2.33E-09
Pu-241	8.03E-08	1.93E-10	4.82E-09	3.21E-07
Ra-224	5.00E-12	1.20E-14	3.00E-13	2.00E-11
Ra-228	3.15E-11	7.60E-14	1.89E-12	1.26E-10
Th-228	5.00E-12	1.20E-14	3.00E-13	2.00E-11
Th-231	3.00E-11	7.20E-14	1.80E-12	1.20E-10
Th-232	3.16E-10	7.60E-13	1.90E-11	1.27E-09
Th-234	3.85E-08	9.23E-11	2.31E-09	1.54E-07
U-235	3.00E-11	7.20E-14	1.80E-12	1.20E-10
U-238	3.85E-08	9.23E-11	2.31E-09	1.54E-07
Total	1.61E-07	3.85E-10	9.64E-09	6.42E-07

TABLE B.4.18 Low-Level Waste, Case 12: Rocky Flats Environment Technology Site

Function: a-Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AS5	IEX	IFF	EQ7
Ac-228	1.94E-08	4.66E-11	1.17E-09	7.77E-08
Am-241	2.89E-08	6.93E-11	1.73E-09	1.15E-07
Bi-212	3.25E-09	7.80E-12	1.95E-10	1.30E-08
Cm-242	4.04E-07	9.70E-10	2.43E-08	1.62E-06
Cm-244	1.44E-07	3.46E-10	8.66E-09	5.77E-07
Pb-212	3.25E-09	7.80E-12	1.95E-10	1.30E-08
Pu-238	1.89E-05	4.54E-08	1.13E-06	7.56E-05
Pu-239	1.44E-06	3.46E-09	8.66E-08	5.77E-06
Pu-240	5.05E-06	1.21E-08	3.03E-07	2.02E-05
Pu-241	6.96E-04	1.67E-06	4.18E-05	2.78E-03
Ra-224	3.25E-09	7.80E-12	1.95E-10	1.30E-08
Ra-228	1.94E-08	4.66E-11	1.17E-09	7.77E-08
Th-228	3.25E-09	7.80E-12	1.95E-10	1.30E-08
Th-231	1.87E-08	4.49E-11	1.12E-09	7.48E-08
Th-232	1.97E-07	4.73E-10	1.18E-08	7.88E-07
Th-234	2.40E-05	5.75E-08	1.44E-06	9.59E-05
U-235	1.86E-08	4.47E-11	1.12E-09	7.45E-08
U-238	2.40E-05	5.75E-08	1.44E-06	9.59E-05
Total	7.70E-04	1.85E-06	4.62E-05	3.08E-03

TABLE B.4.19 Low-Level Waste, Case 12: Rocky Flats Environmental Technology Site

Function: Incineration Waste Stream: Organic				
Nuclide	Release (Ci)			
	AS5	IEX	IFF	EQ7
Ac-228	2.80E-11	6.70E-14	1.68E-12	1.12E-10
Am-241	4.15E-11	1.00E-13	2.49E-12	1.66E-10
Bi-212	4.50E-12	1.10E-14	2.70E-13	1.80E-11
Cm-242	5.77E-10	1.39E-12	3.46E-11	2.31E-09
Cm-244	2.06E-10	4.96E-13	1.24E-11	8.26E-10
Pb-212	4.50E-12	1.10E-14	2.70E-13	1.80E-11
Pu-238	2.70E-08	6.49E-11	1.62E-09	1.08E-07
Pu-239	2.06E-09	4.95E-12	1.24E-10	8.25E-09
Pu-240	7.22E-09	1.73E-11	4.33E-10	2.89E-08
Pu-241	9.94E-07	2.39E-09	5.97E-08	3.98E-06
Ra-224	4.50E-12	1.10E-14	2.70E-13	1.80E-11
Ra-228	2.80E-11	6.70E-14	1.68E-12	1.12E-10
Th-228	4.50E-12	1.10E-14	2.70E-13	1.80E-11
Th-231	2.65E-11	6.40E-14	1.59E-12	1.06E-10
Th-232	2.81E-10	6.76E-13	1.69E-11	1.13E-09
Th-234	3.42E-08	8.22E-11	2.05E-09	1.37E-07
U-235	2.65E-11	6.40E-14	1.59E-12	1.06E-10
U-238	3.42E-08	8.22E-11	2.05E-09	1.37E-07
Total	1.10E-06	2.64E-09	6.60E-08	4.40E-06

TABLE B.4.20 Low-Level Waste, Case 12: Savannah River Site

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	EQ7	IFF	IEX
Ac-228	3.10E-06	2.07E-06	3.10E-08	1.24E-09
Am-241	8.24E-07	5.49E-07	8.24E-09	3.29E-10
Bi-212	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Ce-144	7.54E-04	5.02E-04	7.54E-06	3.01E-07
Co-58	7.65E-04	5.10E-04	7.65E-06	3.06E-07
Co-60	6.01E-03	4.01E-03	6.01E-05	2.40E-06
Cr-51	2.99E-04	2.00E-04	2.99E-06	1.20E-07
Cs-134	2.62E-04	1.75E-04	2.62E-06	1.05E-07
Cs-137	2.42E-03	1.61E-03	2.42E-05	9.66E-07
Eu-152	2.75E-07	1.83E-07	2.75E-09	1.10E-10
Eu-154	4.71E-05	3.14E-05	4.71E-07	1.88E-08
Eu-155	3.73E-05	2.49E-05	3.73E-07	1.49E-08
Fe-55	2.13E-03	1.42E-03	2.13E-05	8.51E-07
Fe-59	1.92E-05	1.28E-05	1.92E-07	7.69E-09
Mn-54	5.70E-04	3.80E-04	5.70E-06	2.28E-07
Ni-59	2.75E-05	1.83E-05	2.75E-07	1.10E-08
Ni-63	3.93E-03	2.62E-03	3.93E-05	1.57E-06
Pb-212	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Pm-147	1.84E-03	1.23E-03	1.84E-05	7.36E-07
Pr-144	7.54E-04	5.02E-04	7.54E-06	3.01E-07
Pr-144m	9.06E-06	6.04E-06	9.06E-08	3.62E-09
Pu-238	5.67E-05	3.78E-05	5.67E-07	2.27E-08
Pu-239	5.49E-07	3.66E-07	5.49E-09	2.20E-10
Pu-240	2.75E-07	1.83E-07	2.75E-09	1.10E-10
Pu-241	6.34E-05	4.23E-05	6.34E-07	2.54E-08
Ra-224	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Ra-228	3.10E-06	2.07E-06	3.10E-08	1.24E-09
Ru-106	2.25E-04	1.50E-04	2.25E-06	9.00E-08
Sb-125	6.47E-05	4.31E-05	6.47E-07	2.59E-08
Sm-151	1.80E-05	1.20E-05	1.80E-07	7.19E-09
Sr-90	2.31E-03	1.54E-03	2.31E-05	9.22E-07
Tc-99	4.12E-07	2.75E-07	4.12E-09	1.65E-10
Te-125m	1.58E-05	1.05E-05	1.58E-07	6.31E-09
Th-228	5.18E-07	3.45E-07	5.18E-09	2.07E-10
Th-231	2.98E-06	1.99E-06	2.98E-08	1.19E-09
Th-232	3.14E-05	2.10E-05	3.14E-07	1.26E-08
Th-234	3.82E-03	2.55E-03	3.82E-05	1.53E-06
U-235	2.97E-06	1.98E-06	2.97E-08	1.19E-09
U-238	3.82E-03	2.55E-03	3.82E-05	1.53E-06
Y-90	2.31E-03	1.54E-03	2.31E-05	9.22E-07
Zr-95	2.33E-05	1.56E-05	2.33E-07	9.34E-09
Total	3.26E-02	2.18E-02	3.26E-04	1.31E-05

TABLE B.4.21 Low-Level Waste, Case 19: Hanford

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	IEX	IFF	EQ7
Ac-228	2.60E-08	1.04E-11	2.60E-10	1.73E-08
Am-241	9.27E-08	3.71E-11	9.27E-10	6.18E-08
Bi-212	4.34E-09	1.74E-12	4.34E-11	2.90E-09
Ce-144	8.43E-05	3.37E-08	8.43E-07	5.62E-05
Cm-242	8.40E-09	3.36E-12	8.40E-11	5.60E-09
Cm-244	3.00E-09	1.20E-12	3.00E-11	2.00E-09
Co-58	1.91E-05	7.65E-09	1.91E-07	1.28E-05
Co-60	3.93E-03	1.57E-06	3.93E-05	2.62E-03
Cr-51	7.49E-06	3.00E-09	7.49E-08	4.99E-06
Cs-134	2.93E-05	1.17E-08	2.93E-07	1.95E-05
Cs-137	6.83E-03	2.73E-06	6.83E-05	4.55E-03
Eu-152	3.07E-08	1.23E-11	3.07E-10	2.05E-08
Eu-154	5.27E-06	2.11E-09	5.27E-08	3.51E-06
Eu-155	4.18E-06	1.67E-09	4.18E-08	2.78E-06
Fe-55	1.48E-04	5.90E-08	1.48E-06	9.84E-05
Fe-59	4.81E-07	1.92E-10	4.81E-09	3.21E-07
Mn-54	1.43E-05	5.70E-09	1.43E-07	9.50E-06
Ni-59	6.87E-07	2.75E-10	6.87E-09	4.58E-07
Ni-63	1.01E-04	4.02E-08	1.01E-06	6.70E-05
P-32	7.87E-03	3.15E-06	7.87E-05	5.25E-03
Pb-212	4.34E-09	1.74E-12	4.34E-11	2.90E-09
Pm-147	2.06E-04	8.23E-08	2.06E-06	1.37E-04
Pr-144	8.43E-05	3.37E-08	8.43E-07	5.62E-05
Pr-144m	1.01E-06	4.05E-10	1.01E-08	6.75E-07
Pu-238	6.73E-06	2.69E-09	6.73E-08	4.49E-06
Pu-239	9.14E-08	3.66E-11	9.14E-10	6.09E-08
Pu-240	1.36E-07	5.43E-11	1.36E-09	9.05E-08
Pu-241	2.16E-05	8.62E-09	2.16E-07	1.44E-05
Ra-224	4.34E-09	1.74E-12	4.34E-11	2.90E-09
Ra-228	2.60E-08	1.04E-11	2.60E-10	1.73E-08
Ru-106	2.52E-05	1.01E-08	2.52E-07	1.68E-05
S-35	6.77E-03	2.71E-06	6.77E-05	4.51E-03
Sb-125	7.23E-06	2.89E-09	7.23E-08	4.82E-06
Sm-151	2.01E-06	8.04E-10	2.01E-08	1.34E-06
Sr-90	2.58E-04	1.03E-07	2.58E-06	1.72E-04
Tc-99	4.61E-08	1.84E-11	4.61E-10	3.07E-08
Te-125m	1.77E-06	7.06E-10	1.77E-08	1.18E-06
Th-228	4.34E-09	1.74E-12	4.34E-11	2.90E-09
Th-231	2.50E-08	1.00E-11	2.50E-10	1.67E-08
Th-232	1.80E-03	7.19E-07	1.80E-05	1.20E-03
Th-234	3.20E-05	1.28E-08	3.20E-07	2.14E-05
U-235	2.49E-08	9.96E-12	2.49E-10	1.66E-08
U-238	2.46E-03	9.84E-07	2.46E-05	1.64E-03
Y-90	2.58E-04	1.03E-07	2.58E-06	1.72E-04
Zr-95	5.84E-07	2.34E-10	5.84E-09	3.89E-07
Total	3.10E-02	1.24E-05	3.10E-04	2.07E-02

**TABLE B.4.22 Low-Level Waste, Case 19: Idaho
National Engineering Laboratory**

Function: a-Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	EQ7	IEX	IFF
Ac-228	1.17E-07	7.77E-08	4.66E-11	1.17E-09
Am-241	1.73E-07	1.15E-07	6.93E-11	1.73E-09
Bi-212	1.95E-08	1.30E-08	7.80E-12	1.95E-10
Cm-242	2.43E-06	1.62E-06	9.70E-10	2.43E-08
Cm-244	8.66E-07	5.77E-07	3.46E-10	8.66E-09
Pb-212	1.95E-08	1.30E-08	7.80E-12	1.95E-10
Pu-238	1.13E-04	7.56E-05	4.54E-08	1.13E-06
Pu-239	8.66E-06	5.77E-06	3.46E-09	8.66E-08
Pu-240	3.03E-05	2.02E-05	1.21E-08	3.03E-07
Pu-241	4.18E-03	2.78E-03	1.67E-06	4.18E-05
Ra-224	1.95E-08	1.30E-08	7.80E-12	1.95E-10
Ra-228	1.17E-07	7.77E-08	4.66E-11	1.17E-09
Th-228	1.95E-08	1.30E-08	7.80E-12	1.95E-10
Th-231	1.12E-07	7.48E-08	4.49E-11	1.12E-09
Th-232	1.18E-06	7.88E-07	4.73E-10	1.18E-08
Th-234	1.44E-04	9.59E-05	5.75E-08	1.44E-06
U-235	1.12E-07	7.45E-08	4.47E-11	1.12E-09
U-238	1.44E-04	9.59E-05	5.75E-08	1.44E-06
Total	4.62E-03	3.08E-03	1.85E-06	4.62E-05

**TABLE B.4.23 Low-Level Waste, Case 19: Idaho
National Engineering Laboratory**

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	EQ7	IEX	IFF
Ac-228	7.92E-05	5.28E-05	3.17E-08	7.92E-07
Am-241	5.12E-06	3.42E-06	2.05E-09	5.12E-08
Bi-212	1.32E-05	8.83E-06	5.30E-09	1.32E-07
Ce-144	2.82E-03	1.88E-03	1.13E-06	2.82E-05
Cm-242	2.86E-05	1.91E-05	1.14E-08	2.86E-07
Cm-244	1.02E-05	6.81E-06	4.09E-09	1.02E-07
Co-58	2.47E-04	1.65E-04	9.88E-08	2.47E-06
Co-60	1.98E-03	1.32E-03	7.94E-07	1.98E-05
Cr-51	9.66E-05	6.44E-05	3.87E-08	9.66E-07
Cs-134	9.79E-04	6.52E-04	3.91E-07	9.79E-06
Cs-137	9.03E-03	6.02E-03	3.61E-06	9.03E-05
Eu-152	1.03E-06	6.84E-07	4.11E-10	1.03E-08
Eu-154	1.76E-04	1.17E-04	7.04E-08	1.76E-06
Eu-155	1.40E-04	9.31E-05	5.58E-08	1.40E-06
Fe-55	6.87E-04	4.58E-04	2.75E-07	6.87E-06
Fe-59	6.21E-06	4.14E-06	2.48E-09	6.21E-08
Mn-54	1.84E-04	1.23E-04	7.36E-08	1.84E-06
Ni-59	8.87E-06	5.91E-06	3.55E-09	8.87E-08
Ni-63	1.36E-03	9.05E-04	5.43E-07	1.36E-05
Pb-212	1.32E-05	8.83E-06	5.30E-09	1.32E-07
Pm-147	6.88E-03	4.58E-03	2.75E-06	6.88E-05
Pr-144	2.82E-03	1.88E-03	1.13E-06	2.82E-05
Pr-144m	3.39E-05	2.26E-05	1.35E-08	3.39E-07
Pu-238	1.55E-03	1.03E-03	6.20E-07	1.55E-05
Pu-239	1.04E-04	6.95E-05	4.17E-08	1.04E-06
Pu-240	3.59E-04	2.39E-04	1.44E-07	3.59E-06
Pu-241	4.95E-02	3.30E-02	1.98E-05	4.95E-04
Ra-224	1.32E-05	8.83E-06	5.30E-09	1.32E-07
Ra-228	7.92E-05	5.28E-05	3.17E-08	7.92E-07
Ru-106	8.42E-04	5.61E-04	3.37E-07	8.42E-06
Sb-125	2.42E-04	1.61E-04	9.67E-08	2.42E-06
Sm-151	6.72E-05	4.48E-05	2.69E-08	6.72E-07
Sr-90	8.62E-03	5.75E-03	3.45E-06	8.62E-05
Tc-99	1.54E-06	1.03E-06	6.16E-10	1.54E-08
Te-125m	5.90E-05	3.93E-05	2.36E-08	5.90E-07
Th-228	1.32E-05	8.83E-06	5.30E-09	1.32E-07
Th-231	7.62E-05	5.08E-05	3.05E-08	7.62E-07
Th-232	8.03E-04	5.36E-04	3.21E-07	8.03E-06
Th-234	9.77E-02	6.51E-02	3.91E-05	9.77E-04
U-235	7.59E-05	5.06E-05	3.04E-08	7.59E-07
U-238	9.77E-02	6.51E-02	3.91E-05	9.77E-04
Y-90	8.62E-03	5.75E-03	3.45E-06	8.62E-05
Zr-95	7.54E-06	5.02E-06	3.01E-09	7.54E-08
Total	2.94E-01	1.96E-01	1.18E-04	2.94E-03

**TABLE B.4.24 Low-Level Waste, Case 19:
Oak Ridge National Laboratory**

Function: Incineration			
Waste Stream: Combustible			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	1.36E-08	8.16E-12	2.04E-10
Am-241	1.40E-11	8.00E-15	2.10E-13
Bi-212	2.27E-09	1.36E-12	3.41E-11
Cm-242	1.86E-10	1.12E-13	2.79E-12
Cm-244	6.60E-11	4.00E-14	9.90E-13
Co-60	4.16E-05	2.50E-08	6.24E-07
Cs-137	7.40E-05	4.44E-08	1.11E-06
Np-237	1.36E-07	8.16E-11	2.04E-09
P-32	8.88E-05	5.33E-08	1.33E-06
Pb-212	2.27E-09	1.36E-12	3.41E-11
Pu-238	8.72E-09	5.23E-12	1.31E-10
Pu-239	1.37E-07	8.20E-11	2.05E-09
Pu-240	2.33E-09	1.40E-12	3.49E-11
Pu-241	3.21E-07	1.93E-10	4.82E-09
Ra-224	2.27E-09	1.36E-12	3.41E-11
Ra-228	1.36E-08	8.16E-12	2.04E-10
S-35	7.64E-05	4.58E-08	1.15E-06
Sr-90	3.17E-05	1.90E-08	4.76E-07
Tc-99	1.81E-07	1.09E-10	2.72E-09
Th-228	2.27E-09	1.36E-12	3.41E-11
Th-231	1.31E-08	7.86E-12	1.96E-10
Th-232	2.04E-05	1.22E-08	3.06E-07
Th-234	1.68E-05	1.01E-08	2.52E-07
U-235	1.30E-08	7.83E-12	1.96E-10
U-238	4.42E-05	2.65E-08	6.63E-07
Y-90	3.17E-05	1.90E-08	4.76E-07
Total	4.26E-04	2.56E-07	6.40E-06

TABLE B.4.25 Low-Level Waste, Case 19: Savannah River Site

Function: Incineration Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	IEX	IFF	EQ7
Ac-228	3.10E-06	1.24E-09	3.10E-08	2.07E-06
Am-241	8.24E-07	3.29E-10	8.24E-09	5.49E-07
Bi-212	5.18E-07	2.07E-10	5.18E-09	3.45E-07
Ce-144	7.54E-04	3.01E-07	7.54E-06	5.02E-04
Co-58	7.65E-04	3.06E-07	7.65E-06	5.10E-04
Co-60	6.01E-03	2.40E-06	6.01E-05	4.01E-03
Cr-51	2.99E-04	1.20E-07	2.99E-06	2.00E-04
Cs-134	2.62E-04	1.05E-07	2.62E-06	1.75E-04
Cs-137	2.42E-03	9.66E-07	2.42E-05	1.61E-03
Eu-152	2.75E-07	1.10E-10	2.75E-09	1.83E-07
Eu-154	4.71E-05	1.88E-08	4.71E-07	3.14E-05
Eu-155	3.73E-05	1.49E-08	3.73E-07	2.49E-05
Fe-55	2.13E-03	8.51E-07	2.13E-05	1.42E-03
Fe-59	1.92E-05	7.69E-09	1.92E-07	1.28E-05
Mn-54	5.70E-04	2.28E-07	5.70E-06	3.80E-04
Ni-59	2.75E-05	1.10E-08	2.75E-07	1.83E-05
Ni-63	3.93E-03	1.57E-06	3.93E-05	2.62E-03
Pb-212	5.18E-07	2.07E-10	5.18E-09	3.45E-07
Pm-147	1.84E-03	7.36E-07	1.84E-05	1.23E-03
Pr-144	7.54E-04	3.01E-07	7.54E-06	5.02E-04
Pr-144m	9.06E-06	3.62E-09	9.06E-08	6.04E-06
Pu-238	5.67E-05	2.27E-08	5.67E-07	3.78E-05
Pu-239	5.49E-07	2.20E-10	5.49E-09	3.66E-07
Pu-240	2.75E-07	1.10E-10	2.75E-09	1.83E-07
Pu-241	6.34E-05	2.54E-08	6.34E-07	4.23E-05
Ra-224	5.18E-07	2.07E-10	5.18E-09	3.45E-07
Ra-228	3.10E-06	1.24E-09	3.10E-08	2.07E-06
Ru-106	2.25E-04	9.00E-08	2.25E-06	1.50E-04
Sb-125	6.47E-05	2.59E-08	6.47E-07	4.31E-05
Sm-151	1.80E-05	7.19E-09	1.80E-07	1.20E-05
Sr-90	2.31E-03	9.22E-07	2.31E-05	1.54E-03
Tc-99	4.12E-07	1.65E-10	4.12E-09	2.75E-07
Te-125m	1.58E-05	6.31E-09	1.58E-07	1.05E-05
Th-228	5.18E-07	2.07E-10	5.18E-09	3.45E-07
Th-231	2.98E-06	1.19E-09	2.98E-08	1.99E-06
Th-232	3.14E-05	1.26E-08	3.14E-07	2.10E-05
Th-234	3.82E-03	1.53E-06	3.82E-05	2.55E-03
U-235	2.97E-06	1.19E-09	2.97E-08	1.98E-06
U-238	3.82E-03	1.53E-06	3.82E-05	2.55E-03
Y-90	2.31E-03	9.22E-07	2.31E-05	1.54E-03
Zr-95	2.33E-05	9.34E-09	2.33E-07	1.56E-05
Total	3.26E-02	1.31E-05	3.26E-04	2.18E-02

TABLE B.4.26 Low-Level Waste, Case 21: Hanford

Function: a-Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	IEX	IFF	EQ7
Ac-228	1.17E-07	4.66E-11	1.17E-09	7.77E-08
Am-241	1.73E-07	6.93E-11	1.73E-09	1.15E-07
Bi-212	1.95E-08	7.80E-12	1.95E-10	1.30E-08
Cm-242	2.43E-06	9.70E-10	2.43E-08	1.62E-06
Cm-244	8.66E-07	3.46E-10	8.66E-09	5.77E-07
Pb-212	1.95E-08	7.80E-12	1.95E-10	1.30E-08
Pu-238	1.13E-04	4.54E-08	1.13E-06	7.56E-05
Pu-239	8.66E-06	3.46E-09	8.66E-08	5.77E-06
Pu-240	3.03E-05	1.21E-08	3.03E-07	2.02E-05
Pu-241	4.18E-03	1.67E-06	4.18E-05	2.78E-03
Ra-224	1.95E-08	7.80E-12	1.95E-10	1.30E-08
Ra-228	1.17E-07	4.66E-11	1.17E-09	7.77E-08
Th-228	1.95E-08	7.80E-12	1.95E-10	1.30E-08
Th-231	1.12E-07	4.49E-11	1.12E-09	7.48E-08
Th-232	1.18E-06	4.73E-10	1.18E-08	7.88E-07
Th-234	1.44E-04	5.75E-08	1.44E-06	9.59E-05
U-235	1.12E-07	4.47E-11	1.12E-09	7.45E-08
U-238	1.44E-04	5.75E-08	1.44E-06	9.59E-05
Total	4.62E-03	1.85E-06	4.62E-05	3.08E-03

TABLE B.4.27 Low-Level Waste, Case 21: Hanford

Function: Incineration				
Waste Stream: Combustible				
Nuclide	Release (Ci)			
	AL7	IEX	IFF	EQ7
Ac-228	8.23E-05	3.29E-08	8.23E-07	5.49E-05
Am-241	6.04E-06	2.42E-09	6.04E-08	4.03E-06
Bi-212	1.38E-05	5.51E-09	1.38E-07	9.18E-06
Ce-144	3.66E-03	1.46E-06	3.66E-05	2.44E-03
Cm-242	2.86E-05	1.15E-08	2.86E-07	1.91E-05
Cm-244	1.02E-05	4.09E-09	1.02E-07	6.82E-06
Co-58	1.03E-03	4.12E-07	1.03E-05	6.87E-04
Co-60	1.20E-02	4.80E-06	1.20E-04	7.99E-03
Cr-51	4.03E-04	1.61E-07	4.03E-06	2.69E-04
Cs-134	1.27E-03	5.08E-07	1.27E-05	8.46E-04
Cs-137	1.84E-02	7.36E-06	1.84E-04	1.23E-02
Eu-152	1.33E-06	5.33E-10	1.33E-08	8.88E-07
Eu-154	2.28E-04	9.13E-08	2.28E-06	1.52E-04
Eu-155	1.81E-04	7.24E-08	1.81E-06	1.21E-04
Fe-55	2.96E-03	1.18E-06	2.96E-05	1.97E-03
Fe-59	2.59E-05	1.04E-08	2.59E-07	1.73E-05
Mn-54	7.68E-04	3.07E-07	7.68E-06	5.12E-04
Ni-59	3.70E-05	1.48E-08	3.70E-07	2.47E-05
Ni-63	5.39E-03	2.15E-06	5.39E-05	3.59E-03
Np-237	2.04E-07	8.16E-11	2.04E-09	1.36E-07
P-32	8.01E-03	3.20E-06	8.01E-05	5.34E-03
Pb-212	1.38E-05	5.51E-09	1.38E-07	9.18E-06
Pm-147	8.92E-03	3.57E-06	8.92E-05	5.95E-03
Pr-144	3.66E-03	1.46E-06	3.66E-05	2.44E-03
Pr-144m	4.39E-05	1.76E-08	4.39E-07	2.93E-05
Pu-238	1.61E-03	6.46E-07	1.61E-05	1.08E-03
Pu-239	1.05E-04	4.20E-08	1.05E-06	7.01E-05
Pu-240	3.59E-04	1.44E-07	3.59E-06	2.39E-04
Pu-241	4.96E-02	1.98E-05	4.96E-04	3.31E-02
Ra-224	1.38E-05	5.51E-09	1.38E-07	9.18E-06
Ra-228	8.23E-05	3.29E-08	8.23E-07	5.49E-05
Ru-106	1.09E-03	4.37E-07	1.09E-05	7.28E-04
S-35	6.88E-03	2.75E-06	6.88E-05	4.59E-03
Sb-125	3.14E-04	1.25E-07	3.14E-06	2.09E-04
Sm-151	8.72E-05	3.49E-08	8.72E-07	5.81E-05
Sr-90	1.12E-02	4.49E-06	1.12E-04	7.49E-03
Tc-99	2.27E-06	9.08E-10	2.27E-08	1.51E-06
Te-125m	7.66E-05	3.06E-08	7.66E-07	5.10E-05
Th-228	1.38E-05	5.51E-09	1.38E-07	9.18E-06
Th-231	7.93E-05	3.17E-08	7.93E-07	5.28E-05
Th-232	2.66E-03	1.07E-06	2.66E-05	1.78E-03
Th-234	1.02E-01	4.06E-05	1.02E-03	6.77E-02
U-235	7.89E-05	3.16E-08	7.89E-07	5.26E-05
U-238	1.04E-01	4.16E-05	1.04E-03	6.94E-02
Y-90	1.12E-02	4.49E-06	1.12E-04	7.49E-03
Zr-95	3.15E-05	1.26E-08	3.15E-07	2.10E-05
Total	3.58E-01	1.43E-04	3.58E-03	2.39E-01

**TABLE B.4.28 Low-Level Waste, All Cases:
Hanford**

Function: Handling			
Waste Stream: All			
Nuclide	Release (Ci), SHA	Nuclide	Release (Ci), SHA
Ac-228	1.06E-10	Pu-238	1.17E-06
Am-241	1.70E-08	Pu-239	1.14E-08
Bi-212	1.77E-11	Pu-240	5.68E-09
Ce-144	1.56E-05	Pu-241	1.31E-06
Co-58	4.00E-06	Ra-224	1.77E-11
Co-60	3.17E-05	Ra-228	1.06E-10
Cr-51	1.57E-06	Ru-106	4.66E-06
Cs-134	5.41E-06	Sb-125	1.34E-06
Cs-137	5.00E-05	Sm-151	3.72E-07
Eu-152	5.68E-09	Sr-90	4.77E-05
Eu-154	9.74E-07	Tc-99	8.52E-09
Eu-155	7.72E-07	Te-125m	3.27E-07
Fe-55	1.11E-05	Th-228	1.77E-11
Fe-59	1.01E-07	Th-231	1.02E-10
H-3	1.25E-04	Th-232	1.07E-09
Mn-54	2.98E-06	Th-234	1.31E-07
Ni-59	1.44E-07	U-235	1.01E-10
Ni-63	2.10E-05	U-238	1.31E-07
Pb-212	1.77E-11	Y-90	4.77E-05
Pm-147	3.80E-05	Zr-95	1.22E-07
Pr-144	1.56E-05	Total	4.29E-04
Pr-144m	1.87E-07		

**TABLE B.4.29 Low-Level Waste, All Cases:
Idaho National Engineering Laboratory**

Function: Handling			
Waste Stream: All			
Nuclide	Release (Ci), SHA	Nuclide	Release (Ci), SHA
Am-241	1.91E-10	Pm-147	4.28E-07
Ce-144	1.75E-07	Pr-144	1.75E-07
Co-58	2.79E-06	Pr-144m	2.11E-09
Co-60	2.18E-05	Pu-238	1.32E-08
Cr-51	1.09E-06	Pu-239	1.28E-10
Cs-134	6.09E-08	Pu-240	6.38E-11
Cs-137	5.62E-07	Pu-241	1.47E-08
Eu-152	6.38E-11	Ru-106	5.23E-08
Eu-154	1.09E-08	Sb-125	1.50E-08
Eu-155	8.68E-09	Sm-151	4.18E-09
Fe-55	7.75E-06	Sr-90	5.36E-07
Fe-59	7.00E-08	Tc-99	9.57E-11
H-3	6.37E-07	Te-125m	3.67E-09
Mn-54	2.08E-06	Y-90	5.36E-07
Ni-59	1.00E-07	Zr-95	8.50E-08
Ni-63	1.42E-05	Total	5.33E-05

**TABLE B.4.30 Low-Level Waste, All Cases:
Los Alamos National Laboratory**

Function: Handling			
Waste Stream: All			
Nuclide	Release (Ci), SHA	Nuclide	Release (Ci), SHA
Ac-228	3.01E-10	Pr-144m	1.37E-06
Am-241	1.25E-07	Pu-238	8.61E-06
Bi-212	5.03E-11	Pu-239	8.37E-08
Ce-144	1.14E-04	Pu-240	4.32E-08
Cm-242	1.25E-10	Pu-241	9.84E-06
Cm-244	4.45E-11	Ra-224	5.03E-11
Co-58	7.70E-08	Ra-228	3.01E-10
Co-60	2.58E-06	Ru-106	3.42E-05
Cr-51	3.01E-08	Sb-125	9.81E-06
Cs-134	3.97E-05	Sm-151	2.73E-06
Cs-137	3.67E-04	Sr-90	3.50E-04
Eu-152	4.17E-08	Tc-99	6.25E-08
Eu-154	7.14E-06	Te-125m	2.40E-06
Eu-155	5.66E-06	Th-228	5.03E-11
Fe-55	2.14E-07	Th-231	2.89E-10
Fe-59	1.94E-09	Th-232	3.05E-09
H-3	2.08E+00	Th-234	3.71E-07
Mn-54	5.74E-08	U-235	2.88E-10
Ni-59	2.77E-09	U-238	3.71E-07
Ni-63	4.33E-06	Y-90	3.50E-04
Pb-212	5.03E-11	Zr-95	2.35E-09
Pm-147	2.79E-04	Total	2.08E+00
Pr-144	1.14E-04		

**TABLE B.4.31 Low-Level Waste, All Cases:
Lawrence Livermore National Laboratory**

Function: Handling			
Waste Stream: All			
Nuclide	Release (Ci), SHA	Nuclide	Release (Ci), SHA
Am-241	1.92E-09	Pr-144m	1.27E-08
C-14	1.84E-05	Pu-238	5.84E-07
Ce-144	1.06E-06	Pu-239	3.93E-08
Cm-242	1.08E-08	Pu-240	1.35E-07
Cm-244	3.85E-09	Pu-241	1.86E-05
Co-60	5.59E-07	Ru-106	3.16E-07
Cs-134	3.67E-07	S-35	9.93E-07
Cs-137	4.35E-06	Sb-125	9.07E-08
Eu-152	3.85E-10	Sm-151	2.52E-08
Eu-154	6.60E-08	Sr-90	3.23E-06
Eu-155	5.24E-08	Tc-99	5.77E-10
H-3	5.25E+00	Te-125m	2.21E-08
Ni-63	3.64E-08	Th-232	2.64E-07
P-32	1.16E-06	U-238	3.56E-07
Pm-147	2.58E-06	Y-90	3.23E-06
Pr-144	1.06E-06	Total	5.25E+00

**TABLE B.4.32 Low-Level Waste, All Cases:
Oak Ridge National Laboratory**

Function: Handling			
Waste Stream: All			
Nuclide	Release (Ci), SHA	Nuclide	Release (Ci), SHA
Ac-228	4.48E-11	Pr-144	1.72E-06
Am-241	1.89E-09	Pr-144m	2.07E-08
Bi-212	7.46E-12	Pu-238	1.34E-07
C-14	1.52E-06	Pu-239	1.59E-09
Ce-144	1.72E-06	Pu-240	1.80E-09
Cm-242	9.39E-11	Pu-241	3.06E-07
Cm-244	3.36E-11	Ra-224	7.46E-12
Co-58	4.50E-07	Ra-228	4.48E-11
Co-60	3.56E-06	Ru-106	5.14E-07
Cr-51	1.76E-07	S-35	1.72E-09
Cs-134	5.97E-07	Sb-125	1.48E-07
Cs-137	5.52E-06	Sm-151	4.10E-08
Eu-152	6.27E-10	Sr-90	6.85E-06
Eu-154	1.07E-07	Tc-99	9.40E-10
Eu-155	8.52E-08	Te-125m	3.60E-08
Fe-55	1.25E-06	Th-228	7.46E-12
Fe-59	1.13E-08	Th-231	4.35E-11
H-3	2.79E-05	Th-232	9.14E-10
Mn-54	3.35E-07	Th-234	5.55E-08
Ni-59	1.62E-08	U-235	4.29E-11
Ni-63	2.36E-06	U-238	5.62E-08
P-32	2.01E-09	Y-90	6.85E-06
Pb-212	7.46E-12	Zr-95	1.37E-08
Pm-147	4.20E-06	Total	6.66E-05

TABLE B.4.33 Low-Level Waste, All Cases: Paducah Gaseous Diffusion Plant

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	7.07E-12
Bi-212	1.19E-12
Np-237	7.98E-11
Pb-212	1.19E-12
Pu-239	7.98E-11
Ra-224	1.19E-12
Ra-228	7.07E-12
Tc-99	1.06E-10
Th-228	1.19E-12
Th-231	6.80E-12
Th-232	7.19E-11
Th-234	8.74E-09
U-235	6.80E-12
U-238	8.74E-09
Total	1.79E-08

TABLE B.4.34 Low-Level Waste, All Cases: Pantex Plant

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	6.36E-11
Bi-212	1.06E-11
H-3	2.96E-03
Pb-212	1.06E-11
Ra-224	1.06E-11
Ra-228	6.36E-11
Th-228	1.06E-11
Th-231	6.12E-11
Th-232	6.45E-10
Th-234	7.84E-08
U-235	6.09E-11
U-238	7.84E-08
Total	2.96E-03

TABLE B.4.35 Low-Level Waste, All Cases: Portsmouth Gaseous Diffusion Plant

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	2.51E-12
Bi-212	4.51E-13
Pb-212	4.51E-13
Ra-224	4.51E-13
Ra-228	2.51E-12
Th-228	4.51E-13
Th-231	2.51E-12
Th-232	2.60E-11
Th-234	3.17E-09
U-235	2.51E-12
U-238	3.17E-09
Total	6.37E-09

TABLE B.4.36 Low-Level Waste, All Cases: Rocky Flats Plant

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	3.00E-11
Am-241	4.47E-11
Bi-212	5.08E-12
Cm-242	6.26E-10
CM-244	2.24E-10
Pb-212	5.08E-12
Pu-238	2.93E-08
Pu-239	2.24E-09
Pu-240	7.82E-09
Pu-241	1.08E-06
Ra-224	5.08E-12
Ra-228	3.00E-11
Th-228	5.08E-12
Th-231	2.90E-11
Th-232	3.05E-10
Th-234	3.71E-08
U-235	2.89E-11
U-238	3.71E-08
Total	1.19E-06

**TABLE B.4.37 Low-Level Waste, All Cases:
Savannah River Site**

Function: Handling			
Waste Stream: All			
Nuclide	Release (Ci), SHA	Nuclide	Release (Ci), SHA
Ac-228	2.78E-11	Pr-144	1.09E-06
Am-241	1.20E-09	Pr-144m	1.31E-08
Bi-212	4.65E-12	Pu-238	8.55E-08
C-14	9.44E-05	Pu-239	1.06E-09
Ce-144	1.09E-06	Pu-240	1.31E-09
Cm-242	7.31E-11	Pu-241	2.18E-07
Cm-244	2.61E-11	Ra-224	4.65E-12
Co-58	4.88E-06	Ra-228	2.78E-11
Co-60	3.83E-05	Ru-106	3.26E-07
Cr-51	1.91E-06	S-35	1.07E-07
Cs-134	3.79E-07	Sb-125	9.36E-08
Cs-137	3.60E-06	Sm-151	2.60E-08
Eu-152	3.97E-10	Sr-90	3.34E-06
Eu-154	6.81E-08	Tc-99	1.23E-06
Eu-155	5.40E-08	Te-125m	2.28E-08
Fe-55	1.36E-05	Th-228	4.65E-12
Fe-59	1.23E-07	Th-231	2.68E-11
H-3	4.80E-02	Th-232	2.86E-08
Mn-54	3.63E-06	Th-234	3.43E-08
Ni-59	1.75E-07	U-235	2.67E-11
Ni-63	2.49E-05	U-238	7.26E-08
P-32	1.24E-07	Y-90	3.34E-06
Pb-212	4.65E-12	Zr-95	1.49E-07
Pm-147	2.66E-06	Total	4.82E-02

B.5 RADIONUCLIDE RELEASES FROM ALPHA-LLMW TREATMENT ACCIDENTS**TABLE B.5.1 Low-Level Mixed Waste,
Case 2: Idaho National Engineering
Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	3.87E-06	2.32E-09	5.81E-08
Co-60	1.22E-03	7.30E-07	1.82E-05
Cs-137	3.60E-03	2.16E-06	5.40E-05
Eu-154	5.81E-06	3.49E-09	8.72E-08
Nb-94	8.13E-05	4.88E-08	1.22E-06
Ni-59	1.86E-03	1.12E-06	2.79E-05
Ni-63	1.71E-01	1.02E-04	2.56E-03
Pu-238	1.80E-04	1.08E-07	2.70E-06
Pu-240	5.81E-06	3.49E-09	8.72E-08
Pu-241	1.55E-04	9.30E-08	2.32E-06
Sm-151	5.23E-05	3.14E-08	7.84E-07
Sr-90	3.25E-03	1.95E-06	4.88E-05
Th-234	3.08E-04	1.85E-07	4.62E-06
U-238	3.08E-04	1.85E-07	4.62E-06
Y-90	3.25E-03	1.95E-06	4.88E-05
Total	1.85E-01	1.11E-04	2.78E-03

**TABLE B.5.2 Low-Level Mixed Waste,
Case 2: Los Alamos National Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.25E-04	7.51E-08	1.88E-06
Cs-137	4.75E-06	2.85E-09	7.12E-08
Eu-154	1.04E-06	6.25E-10	1.56E-08
Fe-55	1.57E-05	9.44E-09	2.36E-07
Ni-59	2.08E-06	1.25E-09	3.13E-08
Ni-63	2.77E-04	1.66E-07	4.15E-06
Pm-147	8.72E-06	5.23E-09	1.31E-07
Pu-238	1.90E-05	1.14E-08	2.84E-07
Pu-239	1.52E-06	9.15E-10	2.29E-08
Pu-240	5.11E-06	3.07E-09	7.67E-08
Pu-241	3.37E-04	2.02E-07	5.06E-06
Sm-151	8.30E-07	4.98E-10	1.24E-08
Sr-90	4.46E-06	2.68E-09	6.70E-08
Y-90	4.46E-06	2.68E-09	6.70E-08
Total	8.07E-04	4.84E-07	1.21E-05

**TABLE B.5.3 Low-Level Mixed Waste,
Case 2: Lawrence Livermore National
Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Cs-137	3.13E-06	1.88E-09	4.69E-08
Pu-238	1.42E-05	8.51E-09	2.13E-07
Pu-241	2.84E-04	1.70E-07	4.26E-06
Sr-90	2.99E-06	1.79E-09	4.48E-08
Th-234	1.45E-05	8.68E-09	2.17E-07
U-238	1.45E-05	8.68E-09	2.17E-07
Y-90	2.99E-06	1.79E-09	4.48E-08
Total	3.36E-04	2.02E-07	5.04E-06

**TABLE B.5.4 Low-Level Mixed Waste,
Case 2: Rocky Flats Environmental
Technology Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	4.81E-08	2.89E-11	7.22E-10
Cm-244	6.51E-08	3.91E-11	9.77E-10
Pu-238	2.51E-05	1.51E-08	3.77E-07
Pu-239	2.58E-06	1.55E-09	3.86E-08
Pu-240	9.00E-06	5.40E-09	1.35E-07
Pu-241	2.46E-04	1.47E-07	3.68E-06
Th-234	2.35E-07	1.41E-10	3.52E-09
U-238	2.35E-07	1.41E-10	3.52E-09
Total	2.83E-04	1.70E-07	4.24E-06

**TABLE B.5.5 Low-Level Mixed Waste,
Case 2: Savannah River Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	1.03E-07	6.17E-11	1.54E-09
Co-60	4.26E-04	2.56E-07	6.39E-06
Cs-137	5.40E-04	3.24E-07	8.10E-06
Eu-154	1.92E-06	1.15E-09	2.88E-08
Eu-155	3.17E-07	1.90E-10	4.75E-09
Fe-55	8.08E-06	4.85E-09	1.21E-07
Nb-94	3.18E-06	1.91E-09	4.77E-08
Ni-59	6.79E-05	4.07E-08	1.02E-06
Ni-63	7.36E-03	4.42E-06	1.10E-04
Pu-238	2.79E-05	1.67E-08	4.19E-07
Pu-239	7.26E-07	4.36E-10	1.09E-08
Pu-240	2.42E-06	1.45E-09	3.63E-08
Pu-241	9.33E-05	5.60E-08	1.40E-06
Sm-151	6.63E-06	3.98E-09	9.94E-08
Sr-90	4.93E-04	2.96E-07	7.40E-06
Tc-99	5.33E-08	3.20E-11	8.00E-10
Th-234	2.28E-06	1.37E-09	3.43E-08
U-238	2.28E-06	1.37E-09	3.43E-08
Y-90	4.93E-04	2.96E-07	7.40E-06
Total	9.53E-03	5.72E-06	1.43E-04

**TABLE B.5.6 Low-Level Mixed Waste,
Case 4: Idaho National Engineering
Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	3.87E-06	2.32E-09	5.81E-08
Co-60	1.22E-03	7.30E-07	1.82E-05
Cs-137	3.60E-03	2.16E-06	5.40E-05
Eu-154	5.81E-06	3.49E-09	8.72E-08
Nb-94	8.13E-05	4.88E-08	1.22E-06
Ni-59	1.86E-03	1.12E-06	2.79E-05
Ni-63	1.71E-01	1.02E-04	2.56E-03
Pu-238	1.80E-04	1.08E-07	2.70E-06
Pu-240	5.81E-06	3.49E-09	8.72E-08
Pu-241	1.55E-04	9.30E-08	2.32E-06
Sm-151	5.23E-05	3.14E-08	7.84E-07
Sr-90	3.25E-03	1.95E-06	4.88E-05
Th-234	3.08E-04	1.85E-07	4.62E-06
U-238	3.08E-04	1.85E-07	4.62E-06
Y-90	3.25E-03	1.95E-06	4.88E-05
Total	1.85E-01	1.11E-04	2.78E-03

**TABLE B.5.7 Low-Level Mixed Waste,
Case 4: Lawrence Livermore National
Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Cs-137	3.13E-06	1.88E-09	4.69E-08
Pu-238	1.42E-05	8.51E-09	2.13E-07
Pu-241	2.84E-04	1.70E-07	4.26E-06
Sr-90	2.99E-06	1.79E-09	4.48E-08
Th-234	1.45E-05	8.68E-09	2.17E-07
U-238	1.45E-05	8.68E-09	2.17E-07
Y-90	2.99E-06	1.79E-09	4.48E-08
Total	3.36E-04	2.02E-07	5.04E-06

**TABLE B.5.8 Low-Level Mixed Waste,
Case 4: Los Alamos National Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.25E-04	7.51E-08	1.88E-06
Cs-137	4.75E-06	2.85E-09	7.12E-08
Eu-154	1.04E-06	6.25E-10	1.56E-08
Fe-55	1.57E-05	9.44E-09	2.36E-07
Ni-59	2.08E-06	1.25E-09	3.13E-08
Ni-63	2.77E-04	1.66E-07	4.15E-06
Pm-147	8.72E-06	5.23E-09	1.31E-07
Pu-238	1.90E-05	1.14E-08	2.84E-07
Pu-239	1.52E-06	9.15E-10	2.29E-08
Pu-240	5.11E-06	3.07E-09	7.67E-08
Pu-241	3.37E-04	2.02E-07	5.06E-06
Sm-151	8.30E-07	4.98E-10	1.24E-08
Sr-90	4.46E-06	2.68E-09	6.70E-08
Y-90	4.46E-06	2.68E-09	6.70E-08
Total	8.07E-04	4.84E-07	1.21E-05

**TABLE B.5.9 Low-Level Mixed Waste,
Case 4: Rocky Flats Environmental
Technology Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	4.81E-08	2.89E-11	7.22E-10
Cm-244	6.51E-08	3.91E-11	9.77E-10
Pu-238	2.51E-05	1.51E-08	3.77E-07
Pu-239	2.58E-06	1.55E-09	3.86E-08
Pu-240	9.00E-06	5.40E-09	1.35E-07
Pu-241	2.46E-04	1.47E-07	3.68E-06
Th-234	2.35E-07	1.41E-10	3.52E-09
U-238	2.35E-07	1.41E-10	3.52E-09
Total	2.83E-04	1.70E-07	4.24E-06

**TABLE B.5.10 Low-Level Mixed Waste,
Case 4: Savannah River Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	1.03E-07	6.17E-11	1.54E-09
Co-60	4.26E-04	2.56E-07	6.39E-06
Cs-137	5.40E-04	3.24E-07	8.10E-06
Eu-154	1.92E-06	1.15E-09	2.88E-08
Eu-155	3.17E-07	1.90E-10	4.75E-09
Fe-55	8.08E-06	4.85E-09	1.21E-07
Nb-94	3.18E-06	1.91E-09	4.77E-08
Ni-59	6.79E-05	4.07E-08	1.02E-06
Ni-63	7.36E-03	4.42E-06	1.10E-04
Pu-238	2.79E-05	1.67E-08	4.19E-07
Pu-239	7.26E-07	4.36E-10	1.09E-08
Pu-240	2.42E-06	1.45E-09	3.63E-08
Pu-241	9.33E-05	5.60E-08	1.40E-06
Sm-151	6.63E-06	3.98E-09	9.94E-08
Sr-90	4.93E-04	2.96E-07	7.40E-06
Tc-99	5.33E-08	3.20E-11	8.00E-10
Th-234	2.28E-06	1.37E-09	3.43E-08
U-238	2.28E-06	1.37E-09	3.43E-08
Y-90	4.93E-04	2.96E-07	7.40E-06
Total	9.53E-03	5.72E-06	1.43E-04

**TABLE B.5.11 Low-Level Mixed Waste,
Case 7: Idaho National Engineering
Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	3.87E-06	2.32E-09	5.81E-08
Co-60	1.22E-03	7.30E-07	1.82E-05
Cs-137	3.60E-03	2.16E-06	5.41E-05
Eu-154	5.81E-06	3.49E-09	8.72E-08
Nb-94	8.13E-05	4.88E-08	1.22E-06
Ni-59	1.86E-03	1.12E-06	2.79E-05
Ni-63	1.71E-01	1.02E-04	2.56E-03
Pu-238	1.80E-04	1.08E-07	2.71E-06
Pu-240	5.81E-06	3.49E-09	8.72E-08
Pu-241	1.62E-04	9.74E-08	2.44E-06
Sm-151	5.23E-05	3.14E-08	7.84E-07
Sr-90	3.26E-03	1.95E-06	4.88E-05
Th-234	3.08E-04	1.85E-07	4.62E-06
U-238	3.08E-04	1.85E-07	4.62E-06
Y-90	3.26E-03	1.95E-06	4.88E-05
Total	1.85E-01	1.11E-04	2.78E-03

**TABLE B.5.12 Low-Level Mixed Waste,
Case 7: Los Alamos National Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.25E-04	7.51E-08	1.88E-06
Cs-137	4.75E-06	2.85E-09	7.12E-08
Eu-154	1.04E-06	6.25E-10	1.56E-08
Fe-55	1.57E-05	9.44E-09	2.36E-07
Ni-59	2.08E-06	1.25E-09	3.13E-08
Ni-63	2.77E-04	1.66E-07	4.15E-06
Pm-147	8.72E-06	5.23E-09	1.31E-07
Pu-238	1.90E-05	1.14E-08	2.84E-07
Pu-239	1.52E-06	9.15E-10	2.29E-08
Pu-240	5.11E-06	3.07E-09	7.67E-08
Pu-241	3.37E-04	2.02E-07	5.06E-06
Sm-151	8.30E-07	4.98E-10	1.24E-08
Sr-90	4.46E-06	2.68E-09	6.70E-08
Y-90	4.46E-06	2.68E-09	6.70E-08
Total	8.07E-04	4.84E-07	1.21E-05

**TABLE B.5.13 Low-Level Mixed Waste,
Case 7: Rocky Flats Environmental
Technology Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	4.81E-08	2.89E-11	7.22E-10
Cm-244	6.51E-08	3.91E-11	9.77E-10
Pu-238	2.51E-05	1.51E-08	3.77E-07
Pu-239	2.58E-06	1.55E-09	3.86E-08
Pu-240	9.00E-06	5.40E-09	1.35E-07
Pu-241	2.46E-04	1.47E-07	3.68E-06
Th-234	2.35E-07	1.41E-10	3.52E-09
U-238	2.35E-07	1.41E-10	3.52E-09
Total	2.83E-04	1.70E-07	4.24E-06

**TABLE B.5.14 Low-Level Mixed Waste,
Case 7: Savannah River Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	1.03E-07	6.17E-11	1.54E-09
Co-60	4.26E-04	2.56E-07	6.39E-06
Cs-137	5.40E-04	3.24E-07	8.10E-06
Eu-154	1.92E-06	1.15E-09	2.88E-08
Eu-155	3.17E-07	1.90E-10	4.75E-09
Fe-55	8.08E-06	4.85E-09	1.21E-07
Nb-94	3.18E-06	1.91E-09	4.77E-08
Ni-59	6.79E-05	4.07E-08	1.02E-06
Ni-63	7.36E-03	4.42E-06	1.10E-04
Pu-238	2.79E-05	1.67E-08	4.19E-07
Pu-239	7.26E-07	4.36E-10	1.09E-08
Pu-240	2.42E-06	1.45E-09	3.63E-08
Pu-241	9.33E-05	5.60E-08	1.40E-06
Sm-151	6.63E-06	3.98E-09	9.94E-08
Sr-90	4.93E-04	2.96E-07	7.40E-06
Tc-99	5.33E-08	3.20E-11	8.00E-10
Th-234	2.28E-06	1.37E-09	3.43E-08
U-238	2.28E-06	1.37E-09	3.43E-08
Y-90	4.93E-04	2.96E-07	7.40E-06
Total	9.53E-03	5.72E-06	1.43E-04

**TABLE B.5.15 Low-Level Mixed Waste,
Case 15: Idaho National Engineering
Laboratory**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	3.87E-06	2.32E-09	5.81E-08
Cm-244	1.28E-09	7.66E-13	1.91E-11
Co-60	1.22E-03	7.30E-07	1.82E-05
Cs-137	3.60E-03	2.16E-06	5.41E-05
Eu-154	5.81E-06	3.49E-09	8.72E-08
Nb-94	8.13E-05	4.88E-08	1.22E-06
Ni-59	1.86E-03	1.12E-06	2.79E-05
Ni-63	1.71E-01	1.02E-04	2.56E-03
Pu-238	1.81E-04	1.09E-07	2.71E-06
Pu-239	5.05E-08	3.03E-11	7.58E-10
Pu-240	5.99E-06	3.59E-09	8.98E-08
Pu-241	1.67E-04	1.00E-07	2.51E-06
Sm-151	5.23E-05	3.14E-08	7.84E-07
Sr-90	3.26E-03	1.95E-06	4.88E-05
Th-234	3.08E-04	1.85E-07	4.62E-06
U-238	3.08E-04	1.85E-07	4.62E-06
Y-90	3.26E-03	1.95E-06	4.88E-05
Total	1.85E-01	1.11E-04	2.78E-03

**TABLE B.5.16 Low-Level Mixed Waste,
Case 15: Savannah River Site**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	1.03E-07	6.17E-11	1.54E-09
Co-60	4.26E-04	2.56E-07	6.39E-06
Cs-137	5.40E-04	3.24E-07	8.10E-06
Eu-154	1.92E-06	1.15E-09	2.88E-08
Eu-155	3.17E-07	1.90E-10	4.75E-09
Fe-55	8.08E-06	4.85E-09	1.21E-07
Nb-94	3.18E-06	1.91E-09	4.77E-08
Ni-59	6.79E-05	4.07E-08	1.02E-06
Ni-63	7.36E-03	4.42E-06	1.10E-04
Pu-238	2.79E-05	1.67E-08	4.19E-07
Pu-239	7.26E-07	4.36E-10	1.09E-08
Pu-240	2.42E-06	1.45E-09	3.63E-08
Pu-241	9.33E-05	5.60E-08	1.40E-06
Sm-151	6.63E-06	3.98E-09	9.94E-08
Sr-90	4.93E-04	2.96E-07	7.40E-06
Tc-99	5.33E-08	3.20E-11	8.00E-10
Th-234	2.28E-06	1.37E-09	3.43E-08
U-238	2.28E-06	1.37E-09	3.43E-08
Y-90	4.93E-04	2.96E-07	7.40E-06
Total	9.53E-03	5.72E-06	1.43E-04

**TABLE B.5.17 Low-Level Mixed Waste,
Case 17: Hanford**

Function: a-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	4.83E-08	2.90E-11	7.24E-10
Cm-244	6.51E-08	3.91E-11	9.77E-10
Co-60	8.08E-08	4.85E-11	1.21E-09
Cs-137	1.16E-07	6.94E-11	1.74E-09
Eu-154	9.26E-10	5.55E-13	1.39E-11
Fe-55	1.01E-08	6.08E-12	1.52E-10
Nb-94	1.46E-11	9.00E-15	2.19E-13
Ni-59	1.67E-09	1.00E-12	2.50E-11
Ni-63	2.12E-07	1.27E-10	3.18E-09
Pm-147	5.62E-09	3.37E-12	8.43E-11
Pu-238	2.52E-05	1.51E-08	3.77E-07
Pu-239	2.58E-06	1.55E-09	3.87E-08
Pu-240	9.01E-06	5.40E-09	1.35E-07
Pu-241	2.46E-04	1.47E-07	3.69E-06
Sm-151	2.97E-09	1.78E-12	4.46E-11
Sr-90	1.04E-07	6.27E-11	1.57E-09
Tc-99	3.78E-11	2.30E-14	5.67E-13
Th-234	2.35E-07	1.41E-10	3.53E-09
U-238	2.35E-07	1.41E-10	3.53E-09
Y-90	1.04E-07	6.27E-11	1.57E-09
Total	2.84E-04	1.70E-07	4.26E-06

**TABLE B.5.18 Low-Level Mixed Waste,
Case 26: Idaho National Engineering
Laboratory**

Function: r-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	6.14E-09	3.68E-12	9.21E-11
Co-60	1.93E-06	1.16E-09	2.89E-08
Cs-137	5.71E-06	3.43E-09	8.57E-08
Eu-154	9.21E-09	5.53E-12	1.38E-10
Nb-94	1.29E-07	7.74E-11	1.93E-09
Ni-59	2.95E-06	1.77E-09	4.42E-08
Ni-63	2.71E-04	1.62E-07	4.06E-06
Pu-238	2.86E-07	1.71E-10	4.28E-09
Pu-240	9.21E-09	5.53E-12	1.38E-10
Pu-241	2.46E-07	1.47E-10	3.68E-09
Sm-151	8.29E-08	4.97E-11	1.24E-09
Sr-90	5.16E-06	3.09E-09	7.74E-08
Th-234	4.88E-07	2.93E-10	7.32E-09
U-238	4.88E-07	2.93E-10	7.32E-09
Y-90	5.16E-06	3.09E-09	7.74E-08
Total	2.93E-04	1.76E-07	4.40E-06

B.6 RADIONUCLIDE RELEASES FROM NON-ALPHA LLMW TREATMENT ACCIDENTS

**TABLE B.6.1 Low-Level Mixed Waste,
Case 1: Idaho National Engineering
Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	2.72E-02	1.63E-05	4.08E-04
Cs-134	1.60E-05	9.60E-09	2.40E-07
Cs-137	1.78E-03	1.07E-06	2.67E-05
Eu-154	2.16E-05	1.30E-08	3.25E-07
Eu-155	1.03E-05	6.21E-09	1.55E-07
Fe-55	3.56E-03	2.13E-06	5.33E-05
Mn-54	1.13E-05	6.77E-09	1.69E-07
Nb-94	1.69E-05	1.02E-08	2.54E-07
Ni-59	3.56E-04	2.13E-07	5.33E-06
Ni-63	4.78E-02	2.87E-05	7.17E-04
Pm-147	1.94E-04	1.16E-07	2.91E-06
Pu-238	5.55E-05	3.33E-08	8.33E-07
Pu-241	4.52E-05	2.71E-08	6.77E-07
Sb-125	7.53E-06	4.52E-09	1.13E-07
Sm-151	1.51E-05	9.03E-09	2.26E-07
Sr-90	1.67E-03	1.00E-06	2.51E-05
Te-125m	1.88E-06	1.13E-09	2.82E-08
Th-234	6.68E-05	4.01E-08	1.00E-06
U-238	6.68E-05	4.01E-08	1.00E-06
Y-90	1.67E-03	1.00E-06	2.51E-05
Total	8.46E-02	5.08E-05	1.27E-03

**TABLE B.6.2 Low-Level Mixed Waste,
Case 1: Oak Ridge National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	IEX	IFF	EQ7
Am-241	3.46E-09	8.64E-08	5.76E-06
Co-60	1.89E-06	4.73E-05	3.15E-03
Cs-137	5.44E-06	1.36E-04	9.06E-03
Eu-154	2.02E-08	5.04E-07	3.36E-05
Eu-155	6.91E-09	1.73E-07	1.15E-05
Nb-94	1.44E-08	3.60E-07	2.40E-05
Ni-59	3.05E-07	7.64E-06	5.09E-04
Ni-63	3.21E-05	8.04E-04	5.36E-02
Pu-238	2.14E-07	5.35E-06	3.57E-04
Pu-239	3.46E-09	8.64E-08	5.76E-06
Pu-240	5.18E-09	1.30E-07	8.64E-06
Pu-241	2.27E-07	5.67E-06	3.78E-04
Sm-151	6.56E-08	1.64E-06	1.09E-04
Sr-90	4.81E-06	1.20E-04	8.02E-03
Tc-99	5.75E-08	1.44E-06	9.59E-05
Th-232	5.76E-09	1.44E-07	9.60E-06
Th-234	6.96E-07	1.74E-05	1.16E-03
U-238	6.96E-07	1.74E-05	1.16E-03
Y-90	4.81E-06	1.20E-04	8.02E-03
Total	5.14E-05	1.29E-03	8.57E-02

**TABLE B.6.3 Low-Level Mixed Waste,
Case 1: Savannah River Site**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	8.07E-03	4.84E-06	1.21E-04
Cs-137	5.87E-03	3.52E-06	8.80E-05
Eu-154	2.95E-05	1.77E-08	4.42E-07
Eu-155	6.80E-06	4.08E-09	1.02E-07
Fe-55	1.61E-04	9.65E-08	2.41E-06
Nb-94	3.85E-05	2.31E-08	5.78E-07
Ni-59	7.61E-04	4.57E-07	1.14E-05
Ni-63	9.21E-02	5.52E-05	1.38E-03
Pu-238	1.99E-04	1.20E-07	2.99E-06
Pu-240	1.59E-04	9.52E-08	2.38E-06
Pu-241	1.59E-04	9.52E-08	2.38E-06
Sm-151	6.34E-05	3.81E-08	9.52E-07
Sr-90	5.46E-03	3.28E-06	8.19E-05
Tc-99	2.27E-06	1.36E-09	3.40E-08
Th-234	2.72E-05	1.63E-08	4.08E-07
U-238	2.72E-05	1.63E-08	4.08E-07
Y-90	5.46E-03	3.28E-06	8.19E-05
Total	1.19E-01	7.11E-05	1.78E-03

**TABLE B.6.4 Low-Level Mixed Waste,
Case 2: Argonne National Laboratory-
East**

Function: Incineration			
Nuclide	Release (Ci)		
	IFF	EQ7	IEX
Am-241	1.24E-08	8.27E-07	4.96E-10
Co-60	6.80E-06	4.53E-04	2.72E-07
Cs-137	1.95E-05	1.30E-03	7.81E-07
Eu-154	7.24E-08	4.82E-06	2.89E-09
Eu-155	2.48E-08	1.65E-06	9.92E-10
Nb-94	5.17E-08	3.45E-06	2.07E-09
Ni-59	1.10E-06	7.31E-05	4.39E-08
Ni-63	1.15E-04	7.69E-03	4.62E-06
Pu-238	7.68E-07	5.12E-05	3.07E-08
Pu-239	1.24E-08	8.27E-07	4.96E-10
Pu-240	1.86E-08	1.24E-06	7.44E-10
Pu-241	8.14E-07	5.43E-05	3.26E-08
Sm-151	2.35E-07	1.57E-05	9.42E-09
Sr-90	1.73E-05	1.15E-03	6.91E-07
Tc-99	2.07E-07	1.38E-05	8.26E-09
Th-232	2.07E-08	1.38E-06	8.27E-10
Th-234	2.50E-06	1.67E-04	1.00E-07
U-238	2.50E-06	1.67E-04	1.00E-07
Y-90	1.73E-05	1.15E-03	6.91E-07
Total	1.85E-04	1.23E-02	7.38E-06

**TABLE B.6.5 Low-Level Mixed Waste,
Case 2: Brookhaven National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	4.36E-08	2.62E-11	6.54E-10
Co-60	2.39E-05	1.43E-08	3.58E-07
Cs-137	6.87E-05	4.12E-08	1.03E-06
Eu-154	2.54E-07	1.53E-10	3.82E-09
Eu-155	8.72E-08	5.23E-11	1.31E-09
Nb-94	1.82E-07	1.09E-10	2.73E-09
Ni-59	3.86E-06	2.31E-09	5.78E-08
Ni-63	4.06E-04	2.43E-07	6.09E-06
Pu-238	2.70E-06	1.62E-09	4.05E-08
Pu-239	4.36E-08	2.62E-11	6.54E-10
Pu-240	6.54E-08	3.93E-11	9.81E-10
Pu-241	2.86E-06	1.72E-09	4.29E-08
Sm-151	8.28E-07	4.97E-10	1.24E-08
Sr-90	6.07E-05	3.64E-08	9.11E-07
Tc-99	7.26E-07	4.36E-10	1.09E-08
Th-232	7.27E-08	4.36E-11	1.09E-09
Th-234	8.79E-06	5.27E-09	1.32E-07
U-238	8.79E-06	5.27E-09	1.32E-07
Y-90	6.07E-05	3.64E-08	9.11E-07
Total	6.49E-04	3.89E-07	9.74E-06

**TABLE B.6.6 Low-Level Mixed Waste,
Case 2: Energy Technology Engineering
Center**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	1.63E-07	9.77E-11	2.44E-09
Co-60	8.92E-05	5.35E-08	1.34E-06
Cs-137	2.56E-04	1.54E-07	3.84E-06
Eu-154	9.49E-07	5.70E-10	1.42E-08
Eu-155	3.26E-07	1.95E-10	4.88E-09
Nb-94	6.78E-07	4.07E-10	1.02E-08
Ni-59	1.44E-05	8.63E-09	2.16E-07
Ni-63	1.51E-03	9.08E-07	2.27E-05
Pu-238	1.01E-05	6.05E-09	1.51E-07
Pu-239	1.63E-07	9.77E-11	2.44E-09
Pu-240	2.44E-07	1.46E-10	3.66E-09
Pu-241	1.07E-05	6.41E-09	1.60E-07
Sm-151	3.09E-06	1.85E-09	4.63E-08
Sr-90	2.27E-04	1.36E-07	3.40E-06
Tc-99	2.71E-06	1.63E-09	4.06E-08
Th-232	2.71E-07	1.63E-10	4.07E-09
Th-234	3.28E-05	1.97E-08	4.92E-07
U-238	3.28E-05	1.97E-08	4.92E-07
Y-90	2.27E-04	1.36E-07	3.40E-06
Total	2.42E-03	1.45E-06	3.63E-05

**TABLE B.6.7 Low-Level Mixed Waste,
Case 2: Fernald Environmental
Management Project**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	3.19E-11	1.90E-14	4.78E-13
Bi-212	5.36E-12	0.00E+00	8.00E-14
Pb-212	5.36E-12	0.00E+00	8.00E-14
Ra-224	5.36E-12	0.00E+00	8.00E-14
Ra-228	3.19E-11	1.90E-14	4.78E-13
Tc-99	5.92E-10	3.55E-13	8.89E-12
Th-228	5.36E-12	0.00E+00	8.00E-14
Th-231	3.07E-11	1.80E-14	4.61E-13
Th-232	3.23E-10	1.94E-13	4.85E-12
Th-234	3.93E-08	2.36E-11	5.90E-10
U-235	3.06E-11	1.80E-14	4.59E-13
U-238	3.93E-08	2.36E-11	5.90E-10
Total	7.97E-08	4.78E-11	1.20E-09

**TABLE B.6.8 Low-Level Mixed Waste,
Case 2: Hanford**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	2.39E-05	1.43E-08	3.58E-07
Co-60	3.54E-05	2.12E-08	5.31E-07
Cs-137	2.81E-02	1.68E-05	4.21E-04
Eu-154	4.22E-05	2.53E-08	6.33E-07
Nb-94	2.40E-06	1.44E-09	3.59E-08
Ni-59	5.41E-05	3.25E-08	8.11E-07
Ni-63	5.56E-03	3.33E-06	8.34E-05
Pu-238	1.26E-03	7.53E-07	1.88E-05
Pu-239	1.70E-05	1.02E-08	2.55E-07
Pu-240	9.70E-06	5.82E-09	1.46E-07
Pu-241	2.78E-04	1.67E-07	4.18E-06
Sm-151	4.04E-04	2.42E-07	6.06E-06
Sr-90	2.50E-02	1.50E-05	3.75E-04
Tc-99	1.26E-05	7.53E-09	1.88E-07
Th-234	1.55E-05	9.31E-09	2.33E-07
U-238	1.55E-05	9.31E-09	2.33E-07
Y-90	2.50E-02	1.50E-05	3.75E-04
Total	8.58E-02	5.15E-05	1.29E-03

**TABLE B.6.9 Low-Level Mixed Waste,
Case 2: Idaho National Engineering
Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	2.75E-02	1.65E-05	4.13E-04
Cs-134	1.62E-05	9.71E-09	2.43E-07
Cs-137	1.80E-03	1.08E-06	2.70E-05
Eu-154	2.19E-05	1.31E-08	3.28E-07
Eu-155	1.05E-05	6.28E-09	1.57E-07
Fe-55	3.60E-03	2.16E-06	5.40E-05
Mn-54	1.14E-05	6.85E-09	1.71E-07
Nb-94	1.71E-05	1.03E-08	2.57E-07
Ni-59	3.60E-04	2.16E-07	5.40E-06
Ni-63	4.84E-02	2.90E-05	7.26E-04
Pm-147	1.96E-04	1.18E-07	2.94E-06
Pu-238	5.62E-05	3.37E-08	8.43E-07
Pu-241	4.57E-05	2.74E-08	6.85E-07
Sb-125	7.62E-06	4.57E-09	1.14E-07
Sm-151	1.52E-05	9.14E-09	2.28E-07
Sr-90	1.69E-03	1.02E-06	2.54E-05
Te-125m	1.90E-06	1.14E-09	2.86E-08
Th-234	6.76E-05	4.06E-08	1.01E-06
U-238	6.76E-05	4.06E-08	1.01E-06
Y-90	1.69E-03	1.02E-06	2.54E-05
Total	8.56E-02	5.14E-05	1.28E-03

**TABLE B.6.10 Low-Level Mixed Waste,
Case 2: Knolls Atomic Power Laboratory,
Schenectady**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.09E-03	6.53E-07	1.63E-05
Cs-134	6.40E-07	3.84E-10	9.59E-09
Cs-137	7.11E-05	4.27E-08	1.07E-06
Eu-154	8.65E-07	5.19E-10	1.30E-08
Eu-155	4.14E-07	2.48E-10	6.21E-09
Fe-55	1.42E-04	8.53E-08	2.13E-06
Mn-54	4.51E-07	2.71E-10	6.77E-09
Nb-94	6.77E-07	4.06E-10	1.02E-08
Ni-59	1.42E-05	8.53E-09	2.13E-07
Ni-63	1.91E-03	1.15E-06	2.87E-05
Pm-147	7.75E-06	4.65E-09	1.16E-07
Pu-238	2.22E-06	1.33E-09	3.33E-08
Pu-241	1.81E-06	1.08E-09	2.71E-08
Sb-125	3.01E-07	1.81E-10	4.51E-09
Sm-151	6.02E-07	3.61E-10	9.03E-09
Sr-90	6.70E-05	4.02E-08	1.00E-06
Te-125m	7.52E-08	4.51E-11	1.13E-09
Th-234	2.67E-06	1.60E-09	4.01E-08
U-238	2.67E-06	1.60E-09	4.01E-08
Y-90	6.70E-05	4.02E-08	1.00E-06
Total	3.38E-03	2.03E-06	5.07E-05

**TABLE B.6.11 Low-Level Mixed Waste,
Case 2: Oak Ridge National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	5.76E-06	3.46E-09	8.64E-08
Co-60	3.15E-03	1.89E-06	4.73E-05
Cs-137	9.06E-03	5.44E-06	1.36E-04
Eu-154	3.36E-05	2.02E-08	5.04E-07
Eu-155	1.15E-05	6.91E-09	1.73E-07
Nb-94	2.40E-05	1.44E-08	3.60E-07
Ni-59	5.09E-04	3.05E-07	7.64E-06
Ni-63	5.36E-02	3.21E-05	8.04E-04
Pu-238	3.57E-04	2.14E-07	5.35E-06
Pu-239	5.76E-06	3.46E-09	8.64E-08
Pu-240	8.64E-06	5.18E-09	1.30E-07
Pu-241	3.78E-04	2.27E-07	5.67E-06
Sm-151	1.09E-04	6.56E-08	1.64E-06
Sr-90	8.02E-03	4.81E-06	1.20E-04
Tc-99	9.59E-05	5.75E-08	1.44E-06
Th-232	9.60E-06	5.76E-09	1.44E-07
Th-234	1.16E-03	6.96E-07	1.74E-05
U-238	1.16E-03	6.96E-07	1.74E-05
Y-90	8.02E-03	4.81E-06	1.20E-04
Total	8.57E-02	5.14E-05	1.29E-03

**TABLE B.6.12 Low-Level Mixed Waste,
Case 2: Paducah Gaseous Diffusion Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	1.46E-06	8.79E-10	2.20E-08
Bi-212	2.42E-07	1.45E-10	3.63E-09
Pb-212	2.42E-07	1.45E-10	3.63E-09
Ra-224	2.42E-07	1.45E-10	3.63E-09
Ra-228	1.46E-06	8.79E-10	2.20E-08
Tc-99	5.94E-04	3.57E-07	8.91E-06
Th-228	2.42E-07	1.45E-10	3.63E-09
Th-231	1.54E-06	9.26E-10	2.31E-08
Th-232	1.62E-05	9.73E-09	2.43E-07
Th-234	1.97E-03	1.18E-06	2.96E-05
U-235	1.53E-06	9.18E-10	2.29E-08
U-238	1.97E-03	1.18E-06	2.96E-05
Total	4.56E-03	2.74E-06	6.85E-05

**TABLE B.6.13 Low-Level Mixed Waste,
Case 2: Pantex Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.19E-04	7.13E-08	1.78E-06
Cs-137	9.00E-05	5.40E-08	1.35E-06
Eu-154	9.90E-07	5.94E-10	1.49E-08
Fe-55	1.49E-05	8.97E-09	2.24E-07
Ni-59	1.98E-06	1.19E-09	2.97E-08
Ni-63	2.63E-04	1.58E-07	3.94E-06
Pm-147	8.28E-06	4.97E-09	1.24E-07
Pu-238	3.42E-06	2.05E-09	5.13E-08
Pu-241	1.73E-05	1.04E-08	2.59E-07
Sm-151	7.92E-07	4.75E-10	1.19E-08
Sr-90	8.46E-05	5.08E-08	1.27E-06
Y-90	8.46E-05	5.08E-08	1.27E-06
Total	6.89E-04	4.13E-07	1.03E-05

**TABLE B.6.14 Low-Level Mixed Waste,
Case 2: Portsmouth Gaseous Diffusion
Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	2.39E-09	1.43E-12	3.58E-11
Bi-212	3.99E-10	2.40E-13	5.99E-12
Pb-212	3.99E-10	2.40E-13	5.99E-12
Ra-224	3.99E-10	2.40E-13	5.99E-12
Ra-228	2.39E-09	1.43E-12	3.58E-11
Tc-99	9.55E-07	5.73E-10	1.43E-08
Th-228	3.99E-10	2.40E-13	5.99E-12
Th-231	2.48E-09	1.49E-12	3.72E-11
Th-232	2.61E-08	1.56E-11	3.91E-10
Th-234	3.17E-06	1.90E-09	4.76E-08
U-235	2.46E-09	1.47E-12	3.69E-11
U-238	3.17E-06	1.90E-09	4.76E-08
Total	7.34E-06	4.40E-09	1.10E-07

**TABLE B.6.15 Low-Level Mixed Waste,
Case 2: Sandia National Laboratory-
New Mexico**

Function: Incineration			
Nuclide	Release (Ci)		
	IEX	IFF	EQ7
Co-60	3.73E-08	9.33E-07	6.22E-05
Cs-137	2.71E-08	6.79E-07	4.52E-05
Eu-154	1.36E-10	3.41E-09	2.27E-07
Eu-155	3.14E-11	7.86E-10	5.24E-08
Fe-55	7.44E-10	1.86E-08	1.24E-06
Nb-94	1.78E-10	4.45E-09	2.97E-07
Ni-59	3.52E-09	8.80E-08	5.87E-06
Ni-63	4.26E-07	1.06E-05	7.10E-04
Pu-238	9.22E-10	2.31E-08	1.54E-06
Pu-240	7.34E-10	1.83E-08	1.22E-06
Pu-241	7.34E-10	1.83E-08	1.22E-06
Sm-151	2.93E-10	7.34E-09	4.89E-07
Sr-90	2.53E-08	6.31E-07	4.21E-05
Tc-99	1.05E-11	2.62E-10	1.75E-08
Th-234	1.26E-10	3.14E-09	2.10E-07
U-238	1.26E-10	3.14E-09	2.10E-07
Y-90	2.53E-08	6.31E-07	4.21E-05
Total	5.48E-07	1.37E-05	9.14E-04

**TABLE B.6.16 Low-Level Mixed Waste,
Case 2: Savannah River Site**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	8.07E-03	4.84E-06	1.21E-04
Cs-137	5.87E-03	3.52E-06	8.80E-05
Eu-154	2.95E-05	1.77E-08	4.42E-07
Eu-155	6.80E-06	4.08E-09	1.02E-07
Fe-55	1.61E-04	9.65E-08	2.41E-06
Nb-94	3.85E-05	2.31E-08	5.78E-07
Ni-59	7.61E-04	4.57E-07	1.14E-05
Ni-63	9.21E-02	5.52E-05	1.38E-03
Pu-238	1.99E-04	1.20E-07	2.99E-06
Pu-240	1.59E-04	9.52E-08	2.38E-06
Pu-241	1.59E-04	9.52E-08	2.38E-06
Sm-151	6.34E-05	3.81E-08	9.52E-07
Sr-90	5.46E-03	3.28E-06	8.19E-05
Tc-99	2.27E-06	1.36E-09	3.40E-08
Th-234	2.72E-05	1.63E-08	4.08E-07
U-238	2.72E-05	1.63E-08	4.08E-07
Y-90	5.46E-03	3.28E-06	8.19E-05
Total	1.19E-01	7.11E-05	1.78E-03

**TABLE B.6.17 Low-Level Mixed Waste,
Case 4: Energy Technology Engineering
Center**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	1.63E-07	9.77E-11	2.44E-09
Co-60	8.92E-05	5.35E-08	1.34E-06
Cs-137	2.56E-04	1.54E-07	3.84E-06
Eu-154	9.49E-07	5.70E-10	1.42E-08
Eu-155	3.26E-07	1.95E-10	4.88E-09
Nb-94	6.78E-07	4.07E-10	1.02E-08
Ni-59	1.44E-05	8.63E-09	2.16E-07
Ni-63	1.51E-03	9.08E-07	2.27E-05
Pu-238	1.01E-05	6.05E-09	1.51E-07
Pu-239	1.63E-07	9.77E-11	2.44E-09
Pu-240	2.44E-07	1.46E-10	3.66E-09
Pu-241	1.07E-05	6.41E-09	1.60E-07
Sm-151	3.09E-06	1.85E-09	4.63E-08
Sr-90	2.27E-04	1.36E-07	3.40E-06
Tc-99	2.71E-06	1.63E-09	4.06E-08
Th-232	2.71E-07	1.63E-10	4.07E-09
Th-234	3.28E-05	1.97E-08	4.92E-07
U-238	3.28E-05	1.97E-08	4.92E-07
Y-90	2.27E-04	1.36E-07	3.40E-06
Total	2.42E-03	1.45E-06	3.63E-05

**TABLE B.6.18 Low-Level Mixed Waste,
Case 4: Fernald Environmental
Management Project**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	3.19E-11	1.90E-14	4.78E-13
Am-241	8.27E-07	4.96E-10	1.24E-08
Bi-212	5.36E-12	0.00E+00	8.00E-14
Co-60	4.53E-04	2.72E-07	6.80E-06
Cs-137	1.30E-03	7.81E-07	1.95E-05
Eu-154	4.82E-06	2.89E-09	7.24E-08
Eu-155	1.65E-06	9.92E-10	2.48E-08
Nb-94	3.45E-06	2.07E-09	5.17E-08
Ni-59	7.31E-05	4.39E-08	1.10E-06
Ni-63	7.69E-03	4.62E-06	1.15E-04
Pb-212	5.36E-12	0.00E+00	8.00E-14
Pu-238	5.12E-05	3.07E-08	7.68E-07
Pu-239	8.27E-07	4.96E-10	1.24E-08
Pu-240	1.24E-06	7.44E-10	1.86E-08
Pu-241	5.43E-05	3.26E-08	8.14E-07
Ra-224	5.36E-12	0.00E+00	8.00E-14
Ra-228	3.19E-11	1.90E-14	4.78E-13
Sm-151	1.57E-05	9.42E-09	2.35E-07
Sr-90	1.15E-03	6.91E-07	1.73E-05
Tc-99	1.38E-05	8.26E-09	2.07E-07
Th-228	5.36E-12	0.00E+00	8.00E-14
Th-231	3.07E-11	1.80E-14	4.61E-13
Th-232	1.38E-06	8.27E-10	2.07E-08
Th-234	1.67E-04	1.00E-07	2.50E-06
U-235	3.06E-11	1.80E-14	4.59E-13
U-238	1.67E-04	1.00E-07	2.50E-06
Y-90	1.15E-03	6.91E-07	1.73E-05
Total	1.23E-02	7.38E-06	1.85E-04

**TABLE B.6.19 Low-Level Mixed Waste,
Case 4: Hanford**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	2.39E-05	1.43E-08	3.58E-07
Co-60	3.54E-05	2.12E-08	5.31E-07
Cs-137	2.81E-02	1.68E-05	4.21E-04
Eu-154	4.22E-05	2.53E-08	6.33E-07
Nb-94	2.40E-06	1.44E-09	3.59E-08
Ni-59	5.41E-05	3.25E-08	8.11E-07
Ni-63	5.56E-03	3.33E-06	8.34E-05
Pu-238	1.26E-03	7.53E-07	1.88E-05
Pu-239	1.70E-05	1.02E-08	2.55E-07
Pu-240	9.70E-06	5.82E-09	1.46E-07
Pu-241	2.78E-04	1.67E-07	4.18E-06
Sm-151	4.04E-04	2.42E-07	6.06E-06
Sr-90	2.50E-02	1.50E-05	3.75E-04
Tc-99	1.26E-05	7.53E-09	1.88E-07
Th-234	1.55E-05	9.31E-09	2.33E-07
U-238	1.55E-05	9.31E-09	2.33E-07
Y-90	2.50E-02	1.50E-05	3.75E-04
Total	8.58E-02	5.15E-05	1.29E-03

**TABLE B.6.20 Low-Level Mixed Waste,
Case 4: Idaho National Engineering
Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	2.75E-02	1.65E-05	4.13E-04
Cs-134	1.62E-05	9.71E-09	2.43E-07
Cs-137	1.80E-03	1.08E-06	2.70E-05
Eu-154	2.19E-05	1.31E-08	3.28E-07
Eu-155	1.05E-05	6.28E-09	1.57E-07
Fe-55	3.60E-03	2.16E-06	5.40E-05
Mn-54	1.14E-05	6.85E-09	1.71E-07
Nb-94	1.71E-05	1.03E-08	2.57E-07
Ni-59	3.60E-04	2.16E-07	5.40E-06
Ni-63	4.84E-02	2.90E-05	7.26E-04
Pm-147	1.96E-04	1.18E-07	2.94E-06
Pu-238	5.62E-05	3.37E-08	8.43E-07
Pu-241	4.57E-05	2.74E-08	6.85E-07
Sb-125	7.62E-06	4.57E-09	1.14E-07
Sm-151	1.52E-05	9.14E-09	2.28E-07
Sr-90	1.69E-03	1.02E-06	2.54E-05
Te-125m	1.90E-06	1.14E-09	2.86E-08
Th-234	6.76E-05	4.06E-08	1.01E-06
U-238	6.76E-05	4.06E-08	1.01E-06
Y-90	1.69E-03	1.02E-06	2.54E-05
Total	8.56E-02	5.14E-05	1.28E-03

**TABLE B.6.21 Low-Level Mixed Waste,
Case 4: Lawrence Livermore National
Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	2.23E-09	1.34E-12	3.34E-11
Co-60	3.03E-03	1.82E-06	4.55E-05
Cs-134	1.78E-06	1.07E-09	2.68E-08
Cs-137	2.02E-04	1.21E-07	3.03E-06
Eu-154	2.43E-06	1.46E-09	3.64E-08
Eu-155	1.16E-06	6.95E-10	1.74E-08
Fe-55	3.97E-04	2.38E-07	5.95E-06
Mn-54	1.26E-06	7.55E-10	1.89E-08
Nb-94	1.90E-06	1.14E-09	2.85E-08
Ni-59	3.98E-05	2.39E-08	5.98E-07
Ni-63	5.35E-03	3.21E-06	8.03E-05
Pm-147	2.16E-05	1.30E-08	3.24E-07
Pu-238	6.33E-06	3.80E-09	9.49E-08
Pu-239	2.23E-09	1.34E-12	3.34E-11
Pu-240	3.34E-09	2.00E-12	5.01E-11
Pu-241	5.18E-06	3.11E-09	7.77E-08
Sb-125	8.39E-07	5.04E-10	1.26E-08
Sm-151	1.72E-06	1.03E-09	2.58E-08
Sr-90	1.90E-04	1.14E-07	2.85E-06
Tc-99	3.71E-08	2.23E-11	5.56E-10
Te-125m	2.10E-07	1.26E-10	3.15E-09
Th-232	3.71E-09	2.23E-12	5.57E-11
Th-234	7.90E-06	4.74E-09	1.18E-07
U-238	7.90E-06	4.74E-09	1.18E-07
Y-90	1.90E-04	1.14E-07	2.85E-06
Total	9.46E-03	5.68E-06	1.42E-04

**TABLE B.6.22 Low-Level Mixed Waste,
Case 4: Los Alamos National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	6.22E-05	3.73E-08	9.33E-07
Cs-137	4.52E-05	2.71E-08	6.79E-07
Eu-154	2.27E-07	1.36E-10	3.41E-09
Eu-155	5.24E-08	3.14E-11	7.86E-10
Fe-55	1.24E-06	7.44E-10	1.86E-08
Nb-94	2.97E-07	1.78E-10	4.45E-09
Ni-59	5.87E-06	3.52E-09	8.80E-08
Ni-63	7.10E-04	4.26E-07	1.06E-05
Pu-238	1.54E-06	9.22E-10	2.31E-08
Pu-240	1.22E-06	7.34E-10	1.83E-08
Pu-241	1.22E-06	7.34E-10	1.83E-08
Sm-151	4.89E-07	2.93E-10	7.34E-09
Sr-90	4.21E-05	2.53E-08	6.31E-07
Tc-99	1.75E-08	1.05E-11	2.62E-10
Th-234	2.10E-07	1.26E-10	3.14E-09
U-238	2.10E-07	1.26E-10	3.14E-09
Y-90	4.21E-05	2.53E-08	6.31E-07
Total	9.14E-04	5.48E-07	1.37E-05

**TABLE B.6.23 Low-Level Mixed Waste,
Case 4: Oak Ridge National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	5.76E-06	3.46E-09	8.64E-08
Co-60	3.15E-03	1.89E-06	4.73E-05
Cs-137	9.06E-03	5.44E-06	1.36E-04
Eu-154	3.36E-05	2.02E-08	5.04E-07
Eu-155	1.15E-05	6.91E-09	1.73E-07
Nb-94	2.40E-05	1.44E-08	3.60E-07
Ni-59	5.09E-04	3.05E-07	7.64E-06
Ni-63	5.36E-02	3.21E-05	8.04E-04
Pu-238	3.57E-04	2.14E-07	5.35E-06
Pu-239	5.76E-06	3.46E-09	8.64E-08
Pu-240	8.64E-06	5.18E-09	1.30E-07
Pu-241	3.78E-04	2.27E-07	5.67E-06
Sm-151	1.09E-04	6.56E-08	1.64E-06
Sr-90	8.02E-03	4.81E-06	1.20E-04
Tc-99	9.59E-05	5.75E-08	1.44E-06
Th-232	9.60E-06	5.76E-09	1.44E-07
Th-234	1.16E-03	6.96E-07	1.74E-05
U-238	1.16E-03	6.96E-07	1.74E-05
Y-90	8.02E-03	4.81E-06	1.20E-04
Total	8.57E-02	5.14E-05	1.29E-03

**TABLE B.6.24 Low-Level Mixed Waste,
Case 4: Paducah Gaseous Diffusion Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	1.46E-06	8.79E-10	2.20E-08
Bi-212	2.42E-07	1.45E-10	3.63E-09
Pb-212	2.42E-07	1.45E-10	3.63E-09
Ra-224	2.42E-07	1.45E-10	3.63E-09
Ra-228	1.46E-06	8.79E-10	2.20E-08
Tc-99	5.94E-04	3.57E-07	8.91E-06
Th-228	2.42E-07	1.45E-10	3.63E-09
Th-231	1.54E-06	9.26E-10	2.31E-08
Th-232	1.62E-05	9.73E-09	2.43E-07
Th-234	1.97E-03	1.18E-06	2.96E-05
U-235	1.53E-06	9.18E-10	2.29E-08
U-238	1.97E-03	1.18E-06	2.96E-05
Total	4.56E-03	2.74E-06	6.85E-05

**TABLE B.6.25 Low-Level Mixed Waste,
Case 4: Pantex Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.19E-04	7.13E-08	1.78E-06
Cs-137	9.00E-05	5.40E-08	1.35E-06
Eu-154	9.90E-07	5.94E-10	1.49E-08
Fe-55	1.49E-05	8.97E-09	2.24E-07
Ni-59	1.98E-06	1.19E-09	2.97E-08
Ni-63	2.63E-04	1.58E-07	3.94E-06
Pm-147	8.28E-06	4.97E-09	1.24E-07
Pu-238	3.42E-06	2.05E-09	5.13E-08
Pu-241	1.73E-05	1.04E-08	2.59E-07
Sm-151	7.92E-07	4.75E-10	1.19E-08
Sr-90	8.46E-05	5.08E-08	1.27E-06
Y-90	8.46E-05	5.08E-08	1.27E-06
Total	6.89E-04	4.13E-07	1.03E-05

**TABLE B.6.26 Low-Level Mixed Waste,
Case 4: Portsmouth Gaseous Diffusion
Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	2.72E-09	1.63E-12	4.08E-11
Am-241	3.14E-08	1.88E-11	4.71E-10
Bi-212	4.55E-10	2.73E-13	6.83E-12
Co-60	3.09E-03	1.86E-06	4.64E-05
Cs-134	1.82E-06	1.09E-09	2.73E-08
Cs-137	2.39E-04	1.43E-07	3.59E-06
Eu-154	2.52E-06	1.51E-09	3.77E-08
Eu-155	1.18E-06	7.06E-10	1.77E-08
Fe-55	4.04E-04	2.43E-07	6.07E-06
Mn-54	1.28E-06	7.70E-10	1.93E-08
Nb-94	1.93E-06	1.16E-09	2.89E-08
Ni-59	4.05E-05	2.43E-08	6.08E-07
Ni-63	5.44E-03	3.27E-06	8.17E-05
Pb-212	4.55E-10	2.73E-13	6.83E-12
Pm-147	2.20E-05	1.32E-08	3.31E-07
Pu-238	7.96E-06	4.78E-09	1.19E-07
Pu-239	2.24E-08	1.34E-11	3.36E-10
Pu-240	1.28E-08	7.66E-12	1.92E-10
Pu-241	5.50E-06	3.30E-09	8.25E-08
Ra-224	4.55E-10	2.73E-13	6.83E-12
Ra-228	2.72E-09	1.63E-12	4.08E-11
Sb-125	8.56E-07	5.14E-10	1.28E-08
Sm-151	2.24E-06	1.35E-09	3.37E-08
Sr-90	2.23E-04	1.34E-07	3.35E-06
Tc-99	9.78E-07	5.87E-10	1.47E-08
Te-125m	2.14E-07	1.28E-10	3.21E-09
Th-228	4.55E-10	2.73E-13	6.83E-12
Th-231	2.80E-09	1.68E-12	4.20E-11
Th-232	2.95E-08	1.77E-11	4.42E-10
Th-234	1.12E-05	6.72E-09	1.68E-07
U-235	2.78E-09	1.67E-12	4.17E-11
U-238	1.12E-05	6.72E-09	1.68E-07
Y-90	2.23E-04	1.34E-07	3.35E-06
Total	9.74E-03	5.84E-06	1.46E-04

**TABLE B.6.27 Low-Level Mixed Waste,
Case 4: Rocky Flats Environmental
Technology Site**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	2.66E-12	0.00E+00	4.00E-14
Bi-212	4.48E-13	0.00E+00	0.00E+00
Pb-212	4.48E-13	0.00E+00	0.00E+00
Ra-224	4.48E-13	0.00E+00	0.00E+00
Ra-228	2.66E-12	0.00E+00	4.00E-14
Tc-99	4.95E-11	3.00E-14	7.43E-13
Th-228	4.48E-13	0.00E+00	0.00E+00
Th-231	2.57E-12	0.00E+00	3.90E-14
Th-232	2.70E-11	1.60E-14	4.05E-13
Th-234	3.29E-09	1.97E-12	4.93E-11
U-235	2.56E-12	0.00E+00	3.80E-14
U-238	3.29E-09	1.97E-12	4.93E-11
Total	6.66E-09	3.99E-12	9.99E-11

**TABLE B.6.28 Low-Level Mixed Waste,
Case 4: Savannah River Site**

Function: Incineration			
Nuclide	Release (Ci)		
	IEX	IFF	EQ7
Co-60	5.10E-06	1.28E-04	8.50E-03
Cs-134	1.54E-10	3.85E-09	2.57E-07
Cs-137	3.54E-06	8.85E-05	5.90E-03
Eu-154	1.79E-08	4.47E-07	2.98E-05
Eu-155	4.18E-09	1.04E-07	6.96E-06
Fe-55	1.31E-07	3.27E-06	2.18E-04
Mn-54	1.09E-10	2.72E-09	1.81E-07
Nb-94	2.33E-08	5.82E-07	3.88E-05
Ni-59	4.60E-07	1.15E-05	7.67E-04
Ni-63	5.57E-05	1.39E-03	9.28E-02
Pm-147	1.87E-09	4.67E-08	3.11E-06
Pu-238	1.20E-07	3.00E-06	2.00E-04
Pu-240	9.52E-08	2.38E-06	1.59E-04
Pu-241	9.56E-08	2.39E-06	1.59E-04
Sb-125	7.26E-11	1.81E-09	1.21E-07
Sm-151	3.82E-08	9.55E-07	6.37E-05
Sr-90	3.29E-06	8.23E-05	5.49E-03
Tc-99	1.36E-09	3.40E-08	2.27E-06
Te-125m	1.81E-11	4.53E-10	3.02E-08
Th-234	1.70E-08	4.24E-07	2.83E-05
U-238	1.70E-08	4.24E-07	2.83E-05
Y-90	3.29E-06	8.23E-05	5.49E-03
Total	7.19E-05	1.80E-03	1.20E-01

**TABLE B.6.29 Low-Level Mixed Waste,
Case 7: Hanford**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	2.39E-05	1.43E-08	3.58E-07
Co-60	3.54E-05	2.12E-08	5.31E-07
Cs-137	2.81E-02	1.68E-05	4.21E-04
Eu-154	4.22E-05	2.53E-08	6.33E-07
Nb-94	2.40E-06	1.44E-09	3.59E-08
Ni-59	5.41E-05	3.25E-08	8.11E-07
Ni-63	5.56E-03	3.33E-06	8.34E-05
Pu-238	1.26E-03	7.53E-07	1.88E-05
Pu-239	1.70E-05	1.02E-08	2.55E-07
Pu-240	9.70E-06	5.82E-09	1.46E-07
Pu-241	2.78E-04	1.67E-07	4.18E-06
Sm-151	4.04E-04	2.42E-07	6.06E-06
Sr-90	2.50E-02	1.50E-05	3.75E-04
Tc-99	1.26E-05	7.53E-09	1.88E-07
Th-234	1.55E-05	9.31E-09	2.33E-07
U-238	1.55E-05	9.31E-09	2.33E-07
Y-90	2.50E-02	1.50E-05	3.75E-04
Total	8.58E-02	5.15E-05	1.29E-03

**TABLE B.6.30 Low-Level Mixed Waste,
Case 7: Idaho National Engineering
Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	4.54E-11	2.70E-14	6.81E-13
Am-241	1.72E-09	1.03E-12	2.59E-11
Bi-212	7.64E-12	0.00E+00	1.15E-13
Co-60	2.75E-02	1.65E-05	4.13E-04
Cs-134	1.62E-05	9.71E-09	2.43E-07
Cs-137	1.80E-03	1.08E-06	2.70E-05
Eu-154	2.19E-05	1.31E-08	3.29E-07
Eu-155	1.05E-05	6.29E-09	1.57E-07
Fe-55	3.60E-03	2.16E-06	5.40E-05
Mn-54	1.14E-05	6.85E-09	1.71E-07
Nb-94	1.71E-05	1.03E-08	2.57E-07
Ni-59	3.60E-04	2.16E-07	5.40E-06
Ni-63	4.84E-02	2.90E-05	7.26E-04
Pb-212	7.64E-12	0.00E+00	1.15E-13
Pm-147	1.96E-04	1.18E-07	2.94E-06
Pu-238	5.63E-05	3.38E-08	8.44E-07
Pu-239	1.72E-09	1.03E-12	2.59E-11
Pu-240	2.59E-09	1.55E-12	3.88E-11
Pu-241	4.58E-05	2.75E-08	6.87E-07
Ra-224	7.64E-12	0.00E+00	1.15E-13
Ra-228	4.54E-11	2.70E-14	6.81E-13
Sb-125	7.62E-06	4.57E-09	1.14E-07
Sm-151	1.53E-05	9.16E-09	2.29E-07
Sr-90	1.70E-03	1.02E-06	2.55E-05
Tc-99	2.96E-08	1.77E-11	4.43E-10
Te-125m	1.90E-06	1.14E-09	2.86E-08
Th-228	7.64E-12	0.00E+00	1.15E-13
Th-231	4.38E-11	2.60E-14	6.57E-13
Th-232	3.33E-09	2.00E-12	5.00E-11
Th-234	6.80E-05	4.08E-08	1.02E-06
U-235	4.36E-11	2.60E-14	6.54E-13
U-238	6.80E-05	4.08E-08	1.02E-06
Y-90	1.70E-03	1.02E-06	2.55E-05
Total	8.56E-02	5.14E-05	1.28E-03

**TABLE B.6.31 Low-Level Mixed Waste,
Case 7: Los Alamos National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.81E-04	1.09E-07	2.72E-06
Cs-137	1.35E-04	8.12E-08	2.03E-06
Eu-154	1.22E-06	7.30E-10	1.83E-08
Eu-155	5.24E-08	3.14E-11	7.86E-10
Fe-55	1.62E-05	9.71E-09	2.43E-07
Nb-94	2.97E-07	1.78E-10	4.45E-09
Ni-59	7.85E-06	4.71E-09	1.18E-07
Ni-63	9.72E-04	5.83E-07	1.46E-05
Pm-147	8.28E-06	4.97E-09	1.24E-07
Pu-238	4.96E-06	2.98E-09	7.44E-08
Pu-240	1.22E-06	7.34E-10	1.83E-08
Pu-241	1.85E-05	1.11E-08	2.78E-07
Sm-151	1.28E-06	7.69E-10	1.92E-08
Sr-90	1.27E-04	7.60E-08	1.90E-06
Tc-99	1.75E-08	1.05E-11	2.62E-10
Th-234	2.10E-07	1.26E-10	3.14E-09
U-238	2.10E-07	1.26E-10	3.14E-09
Y-90	1.27E-04	7.60E-08	1.90E-06
Total	1.60E-03	9.62E-07	2.40E-05

**TABLE B.6.32 Low-Level Mixed Waste,
Case 7: Oak Ridge National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	1.46E-06	8.79E-10	2.20E-08
Am-241	3.00E-06	1.80E-09	4.49E-08
Bi-212	2.42E-07	1.45E-10	3.63E-09
Co-60	1.64E-03	9.85E-07	2.46E-05
Cs-137	4.72E-03	2.83E-06	7.07E-05
Eu-154	1.75E-05	1.05E-08	2.62E-07
Eu-155	5.99E-06	3.59E-09	8.99E-08
Nb-94	1.25E-05	7.49E-09	1.87E-07
Ni-59	2.65E-04	1.59E-07	3.97E-06
Ni-63	2.79E-02	1.67E-05	4.18E-04
Pb-212	2.42E-07	1.45E-10	3.63E-09
Pu-238	1.86E-04	1.11E-07	2.78E-06
Pu-239	3.00E-06	1.80E-09	4.49E-08
Pu-240	4.49E-06	2.70E-09	6.74E-08
Pu-241	1.97E-04	1.18E-07	2.95E-06
Ra-224	2.42E-07	1.45E-10	3.63E-09
Ra-228	1.46E-06	8.79E-10	2.20E-08
Sm-151	5.69E-05	3.41E-08	8.53E-07
Sr-90	4.17E-03	2.50E-06	6.25E-05
Tc-99	6.44E-04	3.86E-07	9.66E-06
Th-228	2.42E-07	1.45E-10	3.63E-09
Th-231	1.54E-06	9.26E-10	2.31E-08
Th-232	2.12E-05	1.27E-08	3.18E-07
Th-234	2.58E-03	1.55E-06	3.86E-05
U-235	1.53E-06	9.18E-10	2.29E-08
U-238	2.58E-03	1.55E-06	3.86E-05
Y-90	4.17E-03	2.50E-06	6.25E-05
Total	4.91E-02	2.95E-05	7.37E-04

**TABLE B.6.33 Low-Level Mixed Waste,
Case 7: Portsmouth Gaseous Diffusion
Plant**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	4.18E-11	2.50E-14	6.26E-13
Am-241	8.32E-07	4.99E-10	1.25E-08
Bi-212	7.02E-12	0.00E+00	1.05E-13
Co-60	2.04E-03	1.22E-06	3.06E-05
Cs-134	9.32E-07	5.59E-10	1.40E-08
Cs-137	1.41E-03	8.47E-07	2.12E-05
Eu-154	6.10E-06	3.66E-09	9.14E-08
Eu-155	2.26E-06	1.35E-09	3.39E-08
Fe-55	2.07E-04	1.24E-07	3.11E-06
Mn-54	6.58E-07	3.95E-10	9.87E-09
Nb-94	4.43E-06	2.66E-09	6.65E-08
Ni-59	9.39E-05	5.63E-08	1.41E-06
Ni-63	1.05E-02	6.29E-06	1.57E-04
Pb-212	7.02E-12	0.00E+00	1.05E-13
Pm-147	1.13E-05	6.78E-09	1.69E-07
Pu-238	5.47E-05	3.28E-08	8.21E-07
Pu-239	8.31E-07	4.99E-10	1.25E-08
Pu-240	1.24E-06	7.46E-10	1.86E-08
Pu-241	5.69E-05	3.42E-08	8.54E-07
Ra-224	7.02E-12	0.00E+00	1.05E-13
Ra-228	4.18E-11	2.50E-14	6.26E-13
Sb-125	4.39E-07	2.63E-10	6.58E-09
Sm-151	1.67E-05	1.00E-08	2.50E-07
Sr-90	1.25E-03	7.53E-07	1.88E-05
Tc-99	1.38E-05	8.27E-09	2.07E-07
Te-125m	1.10E-07	6.58E-11	1.65E-09
Th-228	7.02E-12	0.00E+00	1.05E-13
Th-231	4.10E-11	2.50E-14	6.15E-13
Th-232	1.38E-06	8.27E-10	2.07E-08
Th-234	1.71E-04	1.02E-07	2.56E-06
U-235	4.08E-11	2.40E-14	6.12E-13
U-238	1.71E-04	1.02E-07	2.56E-06
Y-90	1.25E-03	7.53E-07	1.88E-05
Total	1.73E-02	1.04E-05	2.59E-04

**TABLE B.6.34 Low-Level Mixed Waste,
Case 7: Rocky Flats Environmental
Technology Site**

Function: Incineration			
Nuclide	Release (Ci)		
	IEX	IFF	EQ7
Co-60	4.60E-08	1.15E-06	7.67E-05
Cs-134	2.71E-11	6.77E-10	4.51E-08
Cs-137	3.01E-09	7.52E-08	5.02E-06
Eu-154	3.66E-11	9.15E-10	6.10E-08
Eu-155	1.75E-11	4.38E-10	2.92E-08
Fe-55	6.02E-09	1.50E-07	1.00E-05
Mn-54	1.91E-11	4.78E-10	3.18E-08
Nb-94	2.87E-11	7.16E-10	4.78E-08
Ni-59	6.02E-10	1.50E-08	1.00E-06
Ni-63	8.09E-08	2.02E-06	1.35E-04
Pm-147	3.28E-10	8.20E-09	5.47E-07
Pu-238	9.39E-11	2.35E-09	1.57E-07
Pu-241	7.64E-11	1.91E-09	1.27E-07
Sb-125	1.27E-11	3.18E-10	2.12E-08
Sm-151	2.55E-11	6.37E-10	4.25E-08
Sr-90	2.83E-09	7.09E-08	4.72E-06
Te-125m	3.18E-12	7.96E-11	5.31E-09
Th-234	1.13E-10	2.83E-09	1.88E-07
U-238	1.13E-10	2.83E-09	1.88E-07
Y-90	2.83E-09	7.09E-08	4.72E-06
Total	1.43E-07	3.58E-06	2.39E-04

**TABLE B.6.35 Low-Level Mixed Waste,
Case 7: Savannah River Site**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	8.50E-03	5.10E-06	1.28E-04
Cs-134	2.57E-07	1.54E-10	3.85E-09
Cs-137	5.90E-03	3.54E-06	8.85E-05
Eu-154	2.98E-05	1.79E-08	4.47E-07
Eu-155	6.96E-06	4.18E-09	1.04E-07
Fe-55	2.18E-04	1.31E-07	3.27E-06
Mn-54	1.81E-07	1.09E-10	2.72E-09
Nb-94	3.88E-05	2.33E-08	5.82E-07
Ni-59	7.67E-04	4.60E-07	1.15E-05
Ni-63	9.28E-02	5.57E-05	1.39E-03
Pm-147	3.11E-06	1.87E-09	4.67E-08
Pu-238	2.00E-04	1.20E-07	3.00E-06
Pu-240	1.59E-04	9.52E-08	2.38E-06
Pu-241	1.59E-04	9.56E-08	2.39E-06
Sb-125	1.21E-07	7.26E-11	1.81E-09
Sm-151	6.37E-05	3.82E-08	9.55E-07
Sr-90	5.49E-03	3.29E-06	8.23E-05
Tc-99	2.27E-06	1.36E-09	3.40E-08
Te-125m	3.02E-08	1.81E-11	4.53E-10
Th-234	2.83E-05	1.70E-08	4.24E-07
U-238	2.83E-05	1.70E-08	4.24E-07
Y-90	5.49E-03	3.29E-06	8.23E-05
Total	1.20E-01	7.19E-05	1.80E-03

**TABLE B.6.36 Low-Level Mixed Waste,
Case 15: Hanford**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	2.39E-05	1.43E-08	3.58E-07
Co-60	3.54E-05	2.12E-08	5.31E-07
Cs-137	2.81E-02	1.68E-05	4.21E-04
Eu-154	4.22E-05	2.53E-08	6.33E-07
Nb-94	2.40E-06	1.44E-09	3.59E-08
Ni-59	5.41E-05	3.25E-08	8.11E-07
Ni-63	5.56E-03	3.33E-06	8.34E-05
Pu-238	1.26E-03	7.53E-07	1.88E-05
Pu-239	1.70E-05	1.02E-08	2.55E-07
Pu-240	9.70E-06	5.82E-09	1.46E-07
Pu-241	2.78E-04	1.67E-07	4.18E-06
Sm-151	4.04E-04	2.42E-07	6.06E-06
Sr-90	2.50E-02	1.50E-05	3.75E-04
Tc-99	1.26E-05	7.53E-09	1.88E-07
Th-234	1.55E-05	9.31E-09	2.33E-07
U-238	1.55E-05	9.31E-09	2.33E-07
Y-90	2.50E-02	1.50E-05	3.75E-04
Total	8.58E-02	5.15E-05	1.29E-03

**TABLE B.6.37 Low-Level Mixed Waste,
Case 15: Idaho National Engineering
Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	4.57E-11	2.70E-14	6.86E-13
Am-241	1.72E-09	1.03E-12	2.59E-11
Bi-212	7.69E-12	0.00E+00	1.15E-13
Co-60	2.75E-02	1.65E-05	4.13E-04
Cs-134	1.62E-05	9.71E-09	2.43E-07
Cs-137	1.80E-03	1.08E-06	2.71E-05
Eu-154	2.19E-05	1.32E-08	3.29E-07
Eu-155	1.05E-05	6.29E-09	1.57E-07
Fe-55	3.60E-03	2.16E-06	5.40E-05
Mn-54	1.14E-05	6.85E-09	1.71E-07
Nb-94	1.71E-05	1.03E-08	2.57E-07
Ni-59	3.60E-04	2.16E-07	5.40E-06
Ni-63	4.84E-02	2.90E-05	7.26E-04
Pb-212	7.69E-12	0.00E+00	1.15E-13
Pm-147	1.96E-04	1.18E-07	2.95E-06
Pu-238	5.64E-05	3.38E-08	8.46E-07
Pu-239	1.72E-09	1.03E-12	2.59E-11
Pu-240	2.59E-09	1.55E-12	3.88E-11
Pu-241	4.64E-05	2.78E-08	6.95E-07
Ra-224	7.69E-12	0.00E+00	1.15E-13
Ra-228	4.57E-11	2.70E-14	6.86E-13
Sb-125	7.62E-06	4.57E-09	1.14E-07
Sm-151	1.53E-05	9.17E-09	2.29E-07
Sr-90	1.70E-03	1.02E-06	2.55E-05
Tc-99	2.96E-08	1.77E-11	4.43E-10
Te-125m	1.90E-06	1.14E-09	2.86E-08
Th-228	7.69E-12	0.00E+00	1.15E-13
Th-231	4.41E-11	2.70E-14	6.62E-13
Th-232	3.34E-09	2.00E-12	5.01E-11
Th-234	6.80E-05	4.08E-08	1.02E-06
U-235	4.39E-11	2.60E-14	6.59E-13
U-238	6.80E-05	4.08E-08	1.02E-06
Y-90	1.70E-03	1.02E-06	2.55E-05
Total	8.56E-02	5.14E-05	1.28E-03

**TABLE B.6.38 Low-Level Mixed Waste,
Case 15: Oak Ridge National Laboratory**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	8.61E-08	5.16E-11	1.29E-09
Am-241	6.34E-06	3.81E-09	9.51E-08
Bi-212	1.42E-08	8.55E-12	2.14E-10
Co-60	3.53E-03	2.12E-06	5.29E-05
Cs-134	3.00E-08	1.80E-11	4.50E-10
Cs-137	9.99E-03	5.99E-06	1.50E-04
Eu-154	3.70E-05	2.22E-08	5.56E-07
Eu-155	1.27E-05	7.62E-09	1.91E-07
Fe-55	6.66E-06	4.00E-09	1.00E-07
Mn-54	2.12E-08	1.27E-11	3.17E-10
Nb-94	2.65E-05	1.59E-08	3.97E-07
Ni-59	5.61E-04	3.37E-07	8.42E-06
Ni-63	5.91E-02	3.55E-05	8.86E-04
Pb-212	1.42E-08	8.55E-12	2.14E-10
Pm-147	3.63E-07	2.18E-10	5.45E-09
Pu-238	3.93E-04	2.36E-07	5.89E-06
Pu-239	6.34E-06	3.81E-09	9.51E-08
Pu-240	9.51E-06	5.71E-09	1.43E-07
Pu-241	4.16E-04	2.50E-07	6.24E-06
Ra-224	1.42E-08	8.55E-12	2.14E-10
Ra-228	8.61E-08	5.16E-11	1.29E-09
Sb-125	1.41E-08	8.46E-12	2.12E-10
Sm-151	1.20E-04	7.23E-08	1.81E-06
Sr-90	8.83E-03	5.30E-06	1.32E-04
Tc-99	1.38E-04	8.28E-08	2.07E-06
Te-125m	3.53E-09	2.12E-12	5.29E-11
Th-228	1.42E-08	8.55E-12	2.14E-10
Th-231	9.01E-08	5.40E-11	1.35E-09
Th-232	1.15E-05	6.91E-09	1.73E-07
Th-234	1.39E-03	8.36E-07	2.09E-05
U-235	8.93E-08	5.36E-11	1.34E-09
U-238	1.39E-03	8.36E-07	2.09E-05
Y-90	8.83E-03	5.30E-06	1.32E-04
Total	9.48E-02	5.69E-05	1.42E-03

**TABLE B.6.39 Low-Level Mixed Waste,
Case 15: Savannah River Site**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	8.50E-03	5.10E-06	1.28E-04
Cs-134	2.57E-07	1.54E-10	3.85E-09
Cs-137	5.90E-03	3.54E-06	8.85E-05
Eu-154	2.98E-05	1.79E-08	4.47E-07
Eu-155	6.96E-06	4.18E-09	1.04E-07
Fe-55	2.18E-04	1.31E-07	3.27E-06
Mn-54	1.81E-07	1.09E-10	2.72E-09
Nb-94	3.88E-05	2.33E-08	5.82E-07
Ni-59	7.67E-04	4.60E-07	1.15E-05
Ni-63	9.28E-02	5.57E-05	1.39E-03
Pm-147	3.11E-06	1.87E-09	4.67E-08
Pu-238	2.00E-04	1.20E-07	3.00E-06
Pu-240	1.59E-04	9.52E-08	2.38E-06
Pu-241	1.59E-04	9.56E-08	2.39E-06
Sb-125	1.21E-07	7.26E-11	1.81E-09
Sm-151	6.37E-05	3.82E-08	9.55E-07
Sr-90	5.49E-03	3.29E-06	8.23E-05
Tc-99	2.27E-06	1.36E-09	3.40E-08
Te-125m	3.02E-08	1.81E-11	4.53E-10
Th-234	2.83E-05	1.70E-08	4.24E-07
U-238	2.83E-05	1.70E-08	4.24E-07
Y-90	5.49E-03	3.29E-06	8.23E-05
Total	1.20E-01	7.19E-05	1.80E-03

**TABLE B.6.40 Low-Level Mixed Waste,
Case 17: Hanford**

Function: Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Ac-228	8.61E-08	5.17E-11	1.29E-09
Am-241	2.72E-05	1.63E-08	4.09E-07
Bi-212	1.42E-08	8.55E-12	2.14E-10
Co-60	6.81E-03	4.09E-06	1.02E-04
Cs-134	5.70E-07	3.42E-10	8.55E-09
Cs-137	3.64E-02	2.18E-05	5.46E-04
Eu-154	8.33E-05	5.00E-08	1.25E-06
Eu-155	1.50E-05	9.01E-09	2.25E-07
Fe-55	1.73E-04	1.04E-07	2.60E-06
Mn-54	4.02E-07	2.41E-10	6.04E-09
Nb-94	4.03E-05	2.42E-08	6.04E-07
Ni-59	8.41E-04	5.05E-07	1.26E-05
Ni-63	9.22E-02	5.53E-05	1.38E-03
Pb-212	1.42E-08	8.55E-12	2.14E-10
Pm-147	6.91E-06	4.15E-09	1.04E-07
Pu-238	1.55E-03	9.31E-07	2.33E-05
Pu-239	2.12E-05	1.27E-08	3.19E-07
Pu-240	6.39E-05	3.83E-08	9.59E-07
Pu-241	7.21E-04	4.33E-07	1.08E-05
Ra-224	1.42E-08	8.55E-12	2.14E-10
Ra-228	8.61E-08	5.17E-11	1.29E-09
Sb-125	2.68E-07	1.61E-10	4.02E-09
Sm-151	4.93E-04	2.96E-07	7.40E-06
Sr-90	3.24E-02	1.95E-05	4.86E-04
Tc-99	1.50E-04	8.98E-08	2.25E-06
Te-125m	6.71E-08	4.02E-11	1.01E-09
Th-228	1.42E-08	8.55E-12	2.14E-10
Th-231	9.01E-08	5.41E-11	1.35E-09
Th-232	1.15E-05	6.91E-09	1.73E-07
Th-234	1.43E-03	8.58E-07	2.15E-05
U-235	8.94E-08	5.36E-11	1.34E-09
U-238	1.43E-03	8.58E-07	2.15E-05
Y-90	3.24E-02	1.95E-05	4.86E-04
Total	2.07E-01	1.24E-04	3.11E-03

**TABLE B.6.41 Low-Level Mixed Waste,
Case 26: Hanford**

Function: q-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	5.53E-08	3.32E-11	8.30E-10
Co-60	8.21E-08	4.29E-11	1.23E-09
Cs-137	6.51E-08	3.91E-08	9.76E-07
Eu-154	9.80E-08	5.88E-11	1.47E-09
Nb-94	5.56E-09	3.34E-12	8.34E-11
Ni-59	1.26E-07	7.53E-11	1.88E-09
Ni-63	1.29E-05	7.74E-09	1.93E-07
Pu-238	2.91E-06	1.75E-09	4.37E-08
Pu-239	3.95E-08	2.37E-11	5.92E-10
Pu-240	2.25E-08	1.35E-11	3.38E-10
Pu-241	6.46E-07	3.88E-10	9.69E-09
Sm-151	9.37E-07	5.62E-10	1.41E-08
Sr-90	5.80E-05	3.48E-08	8.70E-07
Tc-99	2.91E-08	1.75E-11	4.37E-10
Th-234	3.60E-08	2.16E-11	5.40E-10
U-238	3.60E-08	2.16E-11	5.40E-10
Y-90	5.80E-05	3.48E-08	8.70E-07
Total	1.99E-04	1.19E-07	2.98E-06

**TABLE B.6.42 Low-Level Mixed Waste,
Case 26: Idaho National Engineering
Laboratory**

Function: q-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.19E-01	7.14E-05	1.78E-03
Cs-134	6.99E-05	4.20E-08	1.05E-06
Cs-137	7.78E-03	4.67E-06	1.17E-04
Eu-154	9.46E-05	5.68E-08	1.42E-06
Eu-155	4.53E-05	2.72E-08	6.79E-07
Fe-55	1.56E-02	9.33E-06	2.33E-04
Mn-54	4.94E-05	2.96E-08	7.41E-07
Nb-94	7.41E-05	4.44E-08	1.11E-06
Ni-59	1.56E-03	9.33E-07	2.33E-05
Ni-63	2.09E-01	1.25E-04	3.14E-03
Pm-147	8.48E-04	5.09E-07	1.27E-05
Pu-238	2.43E-04	1.46E-07	3.64E-06
Pu-241	1.97E-04	1.18E-07	2.96E-06
Sb-125	3.29E-05	1.97E-08	4.94E-07
Sm-151	6.58E-05	3.95E-08	9.87E-07
Sr-90	7.32E-03	4.39E-06	1.10E-04
Te-125m	8.23E-06	4.94E-09	1.23E-07
Th-234	2.92E-04	1.75E-07	4.38E-06
U-238	2.92E-04	1.75E-07	4.38E-06
Y-90	7.32E-03	4.39E-06	1.10E-04
Total	3.70E-01	2.22E-04	5.55E-03

**TABLE B.6.43 Low-Level Mixed Waste,
Case 26: Oak Ridge National Laboratory**

Function: q-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Am-241	4.79E-06	2.88E-09	7.19E-08
Co-60	2.63E-03	1.58E-06	3.94E-05
Cs-137	3.77E-03	2.26E-06	5.66E-05
Eu-154	2.80E-05	1.68E-08	4.19E-07
Eu-155	9.58E-06	5.75E-09	1.44E-07
Nb-94	2.00E-05	1.20E-08	2.99E-07
Ni-59	4.24E-04	2.54E-07	6.36E-06
Ni-63	4.46E-02	2.67E-05	6.69E-04
Pu-238	2.97E-04	1.78E-07	4.45E-06
Pu-239	4.79E-06	2.88E-09	7.19E-08
Pu-240	7.19E-06	4.31E-09	1.08E-07
Pu-241	3.14E-04	1.89E-07	4.72E-06
Sm-151	9.10E-05	5.46E-08	1.36E-06
Sr-90	3.34E-03	2.00E-06	5.00E-05
Tc-99	3.99E-05	2.39E-08	5.98E-07
Th-232	7.99E-06	4.79E-09	1.20E-07
Th-234	9.65E-04	5.79E-07	1.45E-05
U-238	9.65E-04	5.79E-07	1.45E-05
Y-90	3.34E-03	2.00E-06	5.00E-05
Total	6.08E-02	3.65E-05	9.12E-04

**TABLE B.6.44 Low-Level Mixed Waste,
Case 26: Savannah River Site**

Function: q-Incineration			
Nuclide	Release (Ci)		
	EQ7	IEX	IFF
Co-60	1.13E-04	6.79E-08	1.70E-06
Cs-137	8.23E-05	4.94E-08	1.23E-06
Eu-154	4.13E-07	2.48E-10	6.20E-09
Eu-155	9.53E-08	5.72E-11	1.43E-09
Fe-55	2.26E-06	1.35E-09	3.38E-08
Nb-94	5.40E-07	3.24E-10	8.10E-09
Ni-59	1.07E-05	6.41E-09	1.60E-07
Ni-63	1.29E-03	7.75E-07	1.94E-05
Pu-238	2.80E-06	1.68E-09	4.19E-08
Pu-240	2.22E-06	1.33E-09	3.34E-08
Pu-241	2.22E-06	1.33E-09	3.34E-08
Sm-151	8.90E-07	5.34E-10	1.33E-08
Sr-90	7.66E-05	4.59E-08	1.15E-06
Tc-99	3.18E-08	1.91E-11	4.77E-10
Th-234	3.81E-07	2.29E-10	5.72E-09
U-238	3.81E-07	2.29E-10	5.72E-09
Y-90	7.66E-05	4.59E-08	1.15E-06
Total	1.66E-03	9.97E-07	2.49E-05

B.7 RADIONUCLIDE RELEASES FROM LLMW DRUM HANDLING ACCIDENTS**TABLE B.7.1 Low-Level Mixed Waste, All Cases: Ames Laboratory**

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Ac-228	9.64E-11
Bi-212	1.62E-11
Pb-212	1.62E-11
Ra-224	1.62E-11
Ra-228	9.64E-11
Tc-99	1.79E-09
Th-228	1.62E-11
Th-231	9.29E-11
Th-232	9.78E-10
Th-234	1.19E-07
U-235	9.26E-11
U-238	1.19E-07
Total	2.41E-07

TABLE B.7.2 Low-Level Mixed Waste, All Cases: Argonne National Laboratory-East

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Am-241	1.90E-08
Co-60	1.04E-05
Cs-137	2.99E-05
Eu-154	1.11E-07
Eu-155	3.80E-08
H-3	6.41E-05
Nb-94	7.92E-08
Ni-59	1.68E-06
Ni-63	1.77E-04
Pu-238	1.18E-06
Pu-239	1.90E-08
Pu-240	2.85E-08
Pu-241	1.25E-06
Sm-151	3.61E-07
Sr-90	2.65E-05
Tc-99	3.17E-07
Th-232	3.17E-08
Th-234	3.83E-06
U-238	3.83E-06
Y-90	2.65E-05
Total	3.47E-04

TABLE B.7.3 Low-Level Mixed Waste, All Cases: Argonne National Laboratory-West

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Co-60	5.41E-04
Cs-134	3.18E-07
Cs-137	3.53E-05
Eu-154	4.30E-07
Eu-155	2.06E-07
Fe-55	7.07E-05
H-3	1.54E-01
Mn-54	2.24E-07
Nb-94	3.37E-07
Ni-59	7.07E-06
Ni-63	9.50E-04
Pm-147	3.85E-06
Pu-238	1.10E-06
Pu-241	8.98E-07
Sb-125	1.50E-07
Sm-151	2.99E-07
Sr-90	3.33E-05
Te-125m	3.74E-08
Th-234	1.33E-06
U-238	1.33E-06
Y-90	3.33E-05
Total	1.56E-01

TABLE B.7.4 Low-Level Mixed Waste, All Cases: Bettis Atomic Power Laboratory

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Am-241	7.01E-08
Co-60	1.04E-07
Cs-137	8.23E-05
Eu-154	1.24E-07
H-3	3.28E-03
Nb-94	7.04E-09
Ni-59	1.58E-07
Ni-63	1.63E-05
Pu-238	3.73E-06
Pu-239	5.43E-08
Pu-240	2.84E-08
Pu-241	1.09E-06
Sm-151	1.18E-06
Sr-90	7.33E-05
Tc-99	3.67E-08
Th-234	4.55E-08
U-238	4.55E-08
Y-90	7.33E-05
Total	3.54E-03

**TABLE B.7.5 Low-Level Mixed Waste,
All Cases: Battelle
Columbus Laboratory**

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	2.14E-11
Bi-212	3.60E-12
Pb-212	3.60E-12
Ra-224	3.60E-12
Ra-228	2.14E-11
Tc-99	3.98E-10
Th-228	3.60E-12
Th-231	2.06E-11
Th-232	2.17E-10
Th-234	2.64E-08
U-235	2.06E-11
U-238	2.64E-08
Total	5.36E-08

**TABLE B.7.6 Low-Level Mixed Waste,
All Cases:
Brookhaven National
Laboratory**

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Am-241	3.01E-10
Co-60	1.65E-07
Cs-137	4.74E-07
Eu-154	1.76E-09
Eu-155	6.02E-10
H-3	2.79E-04
Nb-94	1.25E-09
Ni-59	2.66E-08
Ni-63	2.80E-06
Pu-238	1.87E-08
Pu-239	3.01E-10
Pu-240	4.52E-10
Pu-241	1.98E-08
Sm-151	5.72E-09
Sr-90	4.19E-07
Tc-99	5.01E-09
Th-232	5.02E-10
Th-234	6.07E-08
U-238	6.07E-08
Y-90	4.19E-07
Total	2.83E-04

**TABLE B.7.7 Low-Level Mixed Waste,
All Cases: Charleston
Naval Shipyard**

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	1.38E-04
Cs-134	8.13E-08
Cs-137	9.04E-06
Eu-154	1.10E-07
Eu-155	5.26E-08
Fe-55	1.81E-05
H-3	1.54E-01
Mn-54	5.74E-08
Nb-94	8.61E-08
Ni-59	1.81E-06
Ni-63	2.43E-04
Pm-147	9.85E-07
Pu-238	2.82E-07
Pu-241	2.29E-07
Sb-125	3.82E-08
Sm-151	7.65E-08
Sr-90	8.51E-06
Te-125m	9.56E-09
Th-234	3.39E-07
U-238	3.39E-07
Y-90	8.51E-06
Total	1.54E-01

**TABLE B.7.8 Low-Level Mixed Waste,
All Cases: Colonie
Interim Storage**

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	2.00E-11
Bi-212	3.36E-12
Pb-212	3.36E-12
Ra-224	3.36E-12
Ra-228	2.00E-11
Tc-99	3.71E-10
Th-228	3.36E-12
Th-231	1.93E-11
Th-232	2.03E-10
Th-234	2.47E-08
U-235	1.92E-11
U-238	2.47E-08
Total	5.00E-08

TABLE B.7.9 Low-Level Mixed Waste, All Cases: Energy Technology Engineering Center

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Am-241	2.45E-08
Co-60	1.34E-05
Cs-137	3.85E-05
Eu-154	1.43E-07
Eu-155	4.89E-08
H-3	1.87E-06
Nb-94	1.02E-07
Ni-59	2.16E-06
Ni-63	2.28E-04
Pu-238	1.51E-06
Pu-239	2.45E-08
Pu-240	3.67E-08
Pu-241	1.60E-06
Sm-151	4.64E-07
Sr-90	3.40E-05
Tc-99	4.07E-07
Th-232	4.08E-08
Th-234	4.93E-06
U-238	4.93E-06
Y-90	3.40E-05
Total	3.66E-04

TABLE B.7.10 Low-Level Mixed Waste, All Cases: Fernald Environmental Management Project

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Ac-228	1.81E-10
Bi-212	3.05E-11
Pb-212	3.05E-11
Ra-224	3.05E-11
Ra-228	1.81E-10
Tc-99	3.37E-09
Th-228	3.05E-11
Th-231	1.75E-10
Th-232	1.84E-09
Th-234	2.24E-07
U-235	1.74E-10
U-238	2.24E-07
Total	4.54E-07

TABLE B.7.11 Low-Level Mixed Waste, All Cases: General Atomics

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Ac-228	1.03E-10
Bi-212	1.72E-11
Pb-212	1.72E-11
Ra-224	1.72E-11
Ra-228	1.03E-10
Tc-99	1.91E-09
Th-228	1.72E-11
Th-231	9.89E-11
Th-232	1.04E-09
Th-234	1.27E-07
U-235	9.85E-11
U-238	1.27E-07
Total	2.57E-07

TABLE B.7.12 Low-Level Mixed Waste, All Cases: Grand Junction Project Office

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Ac-228	7.05E-10
Bi-212	1.19E-10
Pb-212	1.19E-10
Ra-224	1.19E-10
Ra-228	7.05E-10
Tc-99	1.31E-08
Th-228	1.19E-10
Th-231	6.80E-10
Th-232	7.16E-09
Th-234	8.70E-07
U-235	6.77E-10
U-238	8.70E-07
Total	1.76E-06

**TABLE B.7.13 Low-Level Mixed Waste,
All Cases: Hanford**

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Am-241	1.42E-07
Co-60	2.10E-07
Cs-137	1.67E-04
Eu-154	2.51E-07
H-3	2.62E-03
Nb-94	1.42E-08
Ni-59	3.21E-07
Ni-63	3.30E-05
Pu-238	7.46E-06
Pu-239	1.01E-07
Pu-240	5.76E-08
Pu-241	1.65E-06
Sm-151	2.40E-06
Sr-90	1.48E-04
Tc-99	7.46E-08
Th-234	9.22E-08
U-238	9.22E-08
Y-90	1.48E-04
Total	3.13E-03

**TABLE B.7.14 Low-Level Mixed Waste,
All Cases: Idaho
National Engineering
Laboratory**

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Am-241	2.44E-08
Co-60	6.51E-05
Cs-134	3.38E-08
Cs-137	2.65E-05
Eu-154	8.23E-08
Eu-155	2.18E-08
Fe-55	7.51E-06
H-3	2.79E-02
Mn-54	2.38E-08
Nb-94	5.49E-07
Ni-59	1.25E-05
Ni-63	1.18E-03
Pm-147	4.09E-07
Pu-238	1.25E-06
Pu-240	3.66E-08
Pu-241	1.07E-06
Sb-125	1.59E-08
Sm-151	3.62E-07
Sr-90	2.41E-05
Te-125m	3.97E-09
Th-234	2.08E-06
U-238	2.08E-06
Y-90	2.41E-05
Total	2.92E-02

TABLE B.7.15 Low-Level Mixed Waste, All Cases: Inhalation Toxicology Research Institute

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Co-60	1.83E-07
Cs-137	1.38E-07
Eu-154	1.52E-09
Fe-55	2.30E-08
H-3	1.33E-01
Ni-59	3.05E-09
Ni-63	4.04E-07
Pm-147	1.27E-08
Pu-238	5.26E-09
Pu-241	2.66E-08
Sm-151	1.22E-09
Sr-90	1.30E-07
Y-90	1.30E-07
Total	1.33E-01

TABLE B.7.16 Low-Level Mixed Waste, All Cases: Knolls Atomic Power Laboratory

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Co-60	3.03E-03
Cs-134	1.78E-06
Cs-137	1.98E-04
Eu-154	2.41E-06
Eu-155	1.15E-06
Fe-55	3.96E-04
H-3	7.26E-02
Mn-54	1.26E-06
Nb-94	1.89E-06
Ni-59	3.96E-05
Ni-63	5.33E-03
Pm-147	2.16E-05
Pu-238	6.19E-06
Pu-241	5.03E-06
Sb-125	8.39E-07
Sm-151	1.68E-06
Sr-90	1.87E-04
Te-125m	2.10E-07
Th-234	7.44E-06
U-238	7.44E-06
Y-90	1.87E-04
Total	8.20E-02

TABLE B.7.17 Low-Level Mixed Waste, All Cases: Kansas City Plant

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	5.41E-04
Cs-134	3.18E-07
Cs-137	3.53E-05
Eu-154	4.30E-07
Eu-155	2.06E-07
Fe-55	7.07E-05
H-3	1.54E-01
Mn-54	2.24E-07
Nb-94	3.37E-07
Ni-59	7.07E-06
Ni-63	9.50E-04
Pm-147	3.85E-06
Pu-238	1.10E-06
Pu-241	8.98E-07
Sb-125	1.50E-07
Sm-151	2.99E-07
Sr-90	3.33E-05
Te-125m	3.74E-08
Th-234	1.33E-06
U-238	1.33E-06
Y-90	3.33E-05
Total	1.56E-01

TABLE B.7.18 Low-Level Mixed Waste, All Cases: Knolls-Kesselring Site

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	3.37E-03
Cs-134	1.98E-06
Cs-137	2.20E-04
Eu-154	2.68E-06
Eu-155	1.28E-06
Fe-55	4.40E-04
H-3	6.26E-02
Mn-54	1.40E-06
Nb-94	2.10E-06
Ni-59	4.40E-05
Ni-63	5.92E-03
Pm-147	2.40E-05
Pu-238	6.87E-06
Pu-241	5.59E-06
Sb-125	9.32E-07
Sm-151	1.86E-06
Sr-90	2.07E-04
Te-125m	2.33E-07
Th-234	8.27E-06
U-238	8.27E-06
Y-90	2.07E-04
Total	7.31E-02

TABLE B.7.19 Low-Level Mixed Waste, All Cases: Knolls-Windsor Site

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	2.03E-03
Cs-134	1.20E-06
Cs-137	1.33E-04
Eu-154	1.62E-06
Eu-155	7.74E-07
Fe-55	2.66E-04
H-3	1.06E-01
Mn-54	8.44E-07
Nb-94	1.27E-06
Ni-59	2.66E-05
Ni-63	3.57E-03
Pm-147	1.45E-05
Pu-238	4.15E-06
Pu-241	3.38E-06
Sb-125	5.63E-07
Sm-151	1.13E-06
Sr-90	1.25E-04
Te-125m	1.41E-07
Th-234	4.99E-06
U-238	4.99E-06
Y-90	1.25E-04
Total	1.12E-01

TABLE B.7.20 Low-Level Mixed Waste, All Cases: Los Alamos National Laboratory

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	1.26E-06
Cs-137	9.56E-07
Eu-154	1.05E-08
Fe-55	1.59E-07
H-3	1.26E-01
Ni-59	2.10E-08
Ni-63	2.79E-06
Pm-147	8.80E-08
Pu-238	7.73E-08
Pu-239	4.07E-09
Pu-240	1.37E-08
Pu-241	1.04E-06
Sm-151	8.40E-09
Sr-90	8.99E-07
Y-90	8.99E-07
Total	1.26E-01

**TABLE B.7.21 Low-Level Mixed Waste,
All Cases: Lawrence
Berkeley Laboratories**

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Cs-137	5.05E-07
H-3	3.15E+00
Pu-241	1.15E-07
Sr-90	4.82E-07
Th-234	1.17E-07
U-238	1.17E-07
Y-90	4.82E-07
Total	3.15E+00

**TABLE B.7.22 Low-Level Mixed Waste,
All Cases: Lab for
Energy Related
Health Research**

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Am-2421	2.78E-09
Co-60	1.52E-06
Cs-137	4.37E-06
Eu-154	1.62E-08
Eu-155	5.55E-09
H-3	2.79E-04
Nb-94	1.16E-08
Ni-59	2.46E-07
Ni-63	2.58E-05
Pu-238	1.72E-07
Pu-239	2.78E-09
Pu-240	4.17E-09
Pu-241	1.82E-07
Sm-151	5.27E-08
Sr-90	3.87E-06
Tc-99	4.62E-08
Th-232	4.63E-09
Th-234	5.59E-07
U-238	5.59E-07
Y-90	3.87E-06
Total	3.20E-04

TABLE B.7.23 Low-Level Mixed Waste, All Cases: Lawrence Livermore National Laboratory

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Cs-137	3.94E-07
H-3	3.08E+00
Pu-238	4.12E-08
Pu-241	8.72E-07
Sr-90	3.76E-07
Th-234	9.14E-08
U-238	9.14E-08
Y-90	3.76E-07
Total	3.08E+00

TABLE B.7.24 Low-Level Mixed Waste, All Cases: Mare Island Naval Shipyard

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	2.80E-03
Cs-134	1.65E-06
Cs-137	1.83E-04
Eu-154	2.23E-06
Eu-155	1.07E-06
Fe-55	3.67E-04
H-3	8.48E-02
Mn-54	1.16E-06
Nb-94	1.75E-06
Ni-59	3.67E-05
Ni-63	4.93E-03
Pm-147	2.00E-05
Pu-238	5.72E-06
Pu-241	4.66E-06
Sb-125	7.76E-07
Sm-151	1.55E-06
Sr-90	1.73E-04
Te-125m	1.94E-07
Th-234	6.89E-06
U-238	6.89E-06
Y-90	1.73E-04
Total	9.36E-02

TABLE B.7.25 Low-Level Mixed Waste, All Cases: Mound Facility

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Cs-137	1.40E-07
H-3	3.14E+00
Pu-238	3.18E-08
Pu-241	6.36E-07
Sr-90	1.34E-07
Th-234	3.24E-08
U-238	3.24E-08
Y-90	1.34E-07
Total	3.14E+00

TABLE B.7.26 Low-Level Mixed Waste, All Cases: Norfolk Naval Shipyard

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	8.49E-04
Cs-134	4.99E-07
Cs-137	5.55E-05
Eu-154	6.75E-07
Eu-155	3.23E-07
Fe-55	1.11E-04
H-3	1.54E-01
Mn-54	3.52E-07
Nb-94	5.28E-07
Ni-59	1.11E-05
Ni-63	1.49E-03
Pm-147	6.05E-06
Pu-238	1.73E-06
Pu-241	1.41E-06
Sb-125	2.35E-07
Sm-151	4.70E-07
Sr-90	5.22E-05
Te-125m	5.87E-08
Th-234	2.08E-06
U-238	2.08E-06
Y-90	5.22E-05
Total	1.57E-01

TABLE B.7.27 Low-Level Mixed Waste, All Cases: Nevada Test Site

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Cs-137	1.39E-06
H-3	3.15E+00
Pu-241	3.15E-07
Sr-90	1.32E-06
Th-234	3.21E-07
U-238	3.21E-07
Y-90	1.32E-06
Total	3.15E+00

TABLE B.7.28 Low-Level Mixed Waste, All Cases: Oak Ridge National Laboratory

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Am-241	3.03E-09
Co-60	1.66E-06
Cs-134	4.78E-06
Eu-154	1.77E-08
Eu-155	6.07E-09
H-3	2.50E-04
Nb-94	1.26E-08
Ni-59	2.68E-07
Ni-63	2.82E-05
Pu-238	1.88E-07
Pu-239	3.03E-09
Pu-240	4.55E-09
Pu-241	1.99E-07
Sm-151	5.76E-08
Sr-90	4.22E-06
Tc-99	5.05E-08
Th-232	5.06E-09
Th-234	6.11E-07
U-238	6.11E-07
Y-90	4.22E-06
Total	2.95E-04

TABLE B.7.29 Low-Level Mixed Waste, All Cases: Paducah Gaseous Diffusion Plant

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	8.18E-09
Bi-212	1.35E-09
Pb-212	1.35E-09
Ra-224	1.35E-09
Ra-228	8.18E-09
Tc-99	3.32E-06
Th-228	1.35E-09
Th-231	8.61E-09
Th-232	9.06E-08
Th-234	1.10E-05
U-235	8.54E-09
U-238	1.10E-05
Total	2.55E-05

TABLE B.7.30 Low-Level Mixed Waste, All Cases: Pantex Plant

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	1.12E-06
Cs-137	8.52E-07
Eu-154	9.37E-09
Fe-55	1.41E-07
H-3	1.28E-01
Ni-59	1.87E-08
Ni-63	2.49E-06
Pm-147	7.84E-08
Pu-238	3.24E-08
Pu-241	1.64E-07
Sm-151	7.50E-09
Sr-90	8.01E-07
Y-90	8.01E-07
Total	1.28E-01

TABLE B.7.31 Low-Level Mixed Waste, All Cases: Pearl Harbor Naval Shipyard

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Co-60	7.22E-04
Cs-134	4.25E-07
Cs-137	4.72E-05
Eu-154	5.74E-07
Eu-155	2.75E-07
Fe-55	9.44E-05
H-3	1.54E-01
Mn-54	3.00E-07
Nb-94	4.50E-07
Ni-59	9.44E-06
Ni-63	1.27E-03
Pm-147	5.14E-06
Pu-238	1.47E-06
Pu-241	1.20E-06
Sb-125	2.00E-07
Sm-151	4.00E-07
Sr-90	4.45E-05
Te-125m	5.00E-08
Th-234	1.77E-06
U-238	1.77E-06
Y-90	4.45E-05
Total	1.56E-01

TABLE B.7.32 Low-Level Mixed Waste, All Cases: Portsmouth Naval Shipyard

Function: Handling	
Waste Stream: All	

Nuclide	Release (Ci), SHA
Co-60	9.62E-04
Cs-134	5.66E-07
Cs-137	6.29E-05
Eu-154	7.66E-07
Eu-155	3.66E-07
Fe-55	1.26E-04
H-3	1.54E-01
Mn-54	3.99E-07
Nb-94	5.99E-07
Ni-59	1.26E-05
Ni-63	1.69E-03
Pm-147	6.86E-06
Pu-238	1.96E-06
Pu-241	1.60E-06
Sb-125	2.66E-07
Sm-151	5.33E-07
Sr-90	5.92E-05
Te-125m	6.66E-08
Th-234	2.36E-06
U-238	2.36E-06
Y-90	5.92E-05
Total	1.57E-01

TABLE B.7.33 Low-Level Mixed Waste, All Cases: Portsmouth Gaseous Diffusion Plant

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Ac-228	1.98E-11
Bi-212	3.30E-12
Pb-212	3.30E-12
Ra-224	3.30E-12
Ra-228	1.98E-11
Tc-99	7.94E-09
Th-228	3.30E-12
Th-231	2.06E-11
Th-232	2.17E-10
Th-234	2.64E-08
U-235	2.04E-11
U-238	2.64E-08
Total	6.10E-08

TABLE B.7.34 Low-Level Mixed Waste, All Cases: Princeton Plasma Physics Laboratory

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Cs-137	1.39E-07
H-3	3.15E+00
Pu-241	3.15E-08
Sr-90	1.32E-07
Th-234	3.21E-08
U-238	3.21E-08
Y-90	1.32E-07
Total	3.15E+00

**TABLE B.7.35 Low-Level Mixed Waste,
All Cases: Puget
Sound Naval Shipyard**

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	5.38E-04
Cs-134	3.16E-07
Cs-137	3.52E-05
Eu-154	4.28E-07
Eu-155	2.05E-07
Fe-55	7.03E-05
H-3	1.54E-01
Mn-54	2.23E-07
Nb-94	3.35E-07
Ni-59	7.03E-06
Ni-63	9.46E-04
Pm-147	3.83E-06
Pu-238	1.10E-06
Pu-241	8.93E-07
Sb-125	1.49E-07
Sm-151	2.98E-07
Sr-90	3.31E-05
Te-125m	3.72E-08
Th-234	1.32E-06
U-238	1.32E-06
Y-90	3.31E-05
Total	1.56E-01

**TABLE B.7.36 Low-Level Mixed Waste,
All Cases: Rocky
Flats Plant**

Function: Handling Waste Stream: All	
Nuclide	Release (Ci), SHA
Am-241	2.99E-10
Cm-244	4.04E-10
Pu-238	1.56E-07
Pu-239	1.60E-08
Pu-240	5.59E-08
Pu-241	1.52E-06
Th-234	1.46E-09
U-238	1.46E-09
Total	1.76E-06

**TABLE B.7.37 Low-Level Mixed Waste,
All Cases: Reactive
Materials, Inc.**

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Ac-228	1.20E-10
Bi-212	2.02E-11
Pb-212	2.02E-11
Ra-224	2.02E-11
Ra-228	1.20E-10
Tc-99	2.24E-09
Th-228	2.02E-11
Th-231	1.16E-10
Th-232	1.22E-09
Th-234	1.49E-07
U-235	1.16E-10
U-238	1.49E-07
Total	3.01E-07

**TABLE B.7.38 Low-Level Mixed Waste,
All Cases: Sandia
National Laboratories
- New Mexico**

Function: Handling
Waste Stream: All

Nuclide	Release (Ci), SHA
Co-60	8.77E-06
Cs-137	6.38E-06
Eu-154	3.20E-08
Eu-155	7.39E-09
Fe-55	1.75E-07
H-3	1.11E-01
Nb-94	4.19E-08
Ni-59	8.28E-07
Ni-63	1.00E-04
Pu-238	2.17E-07
Pu-240	1.72E-07
Pu-241	1.72E-07
Sm-151	6.90E-08
Sr-90	5.94E-06
Tc-99	2.46E-09
Th-234	2.96E-08
U-238	2.96E-08
Y-90	5.94E-06
Total	1.12E-01

TABLE B.7.39 Low-Level Mixed Waste, All Cases: Sandia National Laboratories - Livermore

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Cs-137	2.17E-07
H-3	3.14E+00
Pu-241	4.93E-08
Sr-90	2.07E-07
Th-234	5.03E-08
U-238	5.03E-08
Y-90	2.07E-07
Total	3.14E+00

TABLE B.7.40 Low-Level Mixed Waste, All Cases: Savannah River Site

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Co-60	5.04E-06
Cs-137	3.93E-06
Eu-154	1.89E-08
Eu-155	4.15E-09
Fe-55	9.96E-08
H-3	1.03E-01
Nb-94	2.68E-08
Ni-59	5.42E-07
Ni-63	6.35E-05
Pu-238	1.53E-07
Pu-239	1.52E-09
Pu-240	8.48E-08
Pu-241	2.97E-07
Sm-151	4.34E-08
Sr-90	3.65E-06
Tc-99	1.13E-09
Th-234	1.89E-08
U-238	1.89E-08
Y-90	3.65E-06
Total	1.03E-01

TABLE B.7.41 Low-Level Mixed Waste, All Cases: University of Missouri, Columbia

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Am-241	2.21E-10
Cm-244	2.99E-10
Pu-238	1.15E-07
Pu-239	1.18E-08
Pu-240	4.13E-08
Pu-241	1.13E-06
Th-234	1.08E-09
U-238	1.08E-09
Total	1.30E-06

TABLE B.7.42 Low-Level Mixed Waste, All Cases: West Valley Demonstration Project

Function: Handling	
Waste Stream: All	
Nuclide	Release (Ci), SHA
Am-241	3.13E-08
Co-60	4.57E-08
Cs-137	3.65E-05
Eu-154	5.45E-08
H-3	3.62E-03
Nb-94	3.13E-09
Ni-59	7.00E-08
Ni-63	7.20E-06
Pu-238	1.70E-06
Pu-239	2.82E-08
Pu-240	1.25E-08
Pu-241	7.31E-07
Sm-151	5.23E-07
Sr-90	3.25E-05
Tc-99	1.62E-08
Th-234	2.01E-08
U-238	2.01E-08
Y-90	3.25E-05
Total	3.73E-03